

IBM SYSTEMS OPERATIONS/OUTSOURCING

MARKET ANALYSIS

1991-1996

INPUT

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U.S. SYSTEMS OPERATIONS/ OUTSOURCING MARKET ANALYSIS

1991-1996

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Systems Operations Program (SOP)

***U.S. Systems Operations/Outsourcing
Market Analysis, 1991-1996***

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Abstract

This report analyzes the systems operations/outsourcing market as it existed in 1990 and 1991, forecasts the growth for the market through 1996, and examines the issues and trends that affect the market. The analysis includes identification of forces affecting the market in general, as well as within each of the 15 vertical industry markets.

This report further analyzes two types of processing: platform operations, where responsibility for the applications software remains with the client, and applications operations, where the vendor provides applications software development and maintenance as well as processing support. It assesses the growth potential for each mode and shows why each is growing at a different rate.

The report includes a discussion of the leading vendors and their evolving strategies. Issues of vendor/client partnerships and risk assessment and containment are explored. A review of buyer motivations leads to suggestions about what constitutes good systems operations prospects.

This report contains 138 pages and 81 exhibits, and was prepared as part of INPUT's 1991 Systems Operations Program.



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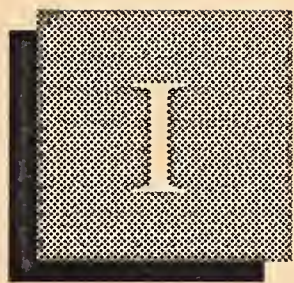
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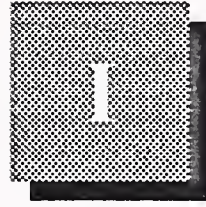
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Introduction



Introduction

This report has been prepared by INPUT as an update and revision of *U.S. Systems Operations Market, 1990-1995*. It analyzes the market for vendor-provided systems operations/outsourcing services in the U.S. commercial and federal markets. A forecast for the systems operations market for the period 1991-1996, including the prospects in each of 15 vertical markets, is presented.

Market revenue forecasts are also provided for applications versus platform systems operations. Marketing recommendations are developed for vendors based on user surveys conducted during 1991.

A

Scope

This report includes a forecast of the federal and commercial systems operations markets for 1991 to 1996 in the United States. The market prospects for each of 15 vertical markets are examined, and the leading vendors in each of those sectors are identified. Market structure is analyzed to clarify the types of systems operations that comprise the market. Exhibit I-1 identifies the two types of operations. User issues are analyzed to identify market trends and develop recommendations for vendors to successfully market to systems operations prospects.

B

Report Organization

This report, *U.S. Systems Operations/Outsourcing Market, 1991-1996*, is organized as follows:

- Section II, *Executive Overview*, provides an overview of the report and highlights the significant information that follows.

EXHIBIT I-1

Systems Operations Type Definitions

- Types of systems operations
 - Platform operations—vendor operates computer system/network only
 - Applications operations—vendor has responsibility for system/network and applications software

- Section III, *Market Analysis and Forecast*, identifies the general market characteristics and defines market sectors while differentiating between commercial and federal markets. It forecasts growth for the next five years by vertical industry as well as by type of systems operation. It concludes by identifying key marketplace factors and describing the competitive environment that currently exists.
- Section IV, *Vertical Industry Markets*, details the penetration of systems operations in the 15 vertical industry markets identified by INPUT. The forecast in each market sector is complemented by an analysis of the information services environment in that sector, and the potential for systems operations as a result of that environment.
- Section V, *Market Strategies and Recommendations*, crystallizes the data developed in the earlier sections into a set of marketing and sales strategies. Attention is focused on two trends: the new partnership relationship evolving between clients and vendors in the systems operations market; and the fact that prospects are becoming more sophisticated in evaluating and selecting systems operations vendors.

The report includes three appendixes:

- Appendix A gives Standard Industrial Classification Codes.
- Appendix B contains the forecast data base used by INPUT for this analysis.
- Appendix C contains the reconciliation of the current forecast data base with that used in the previous year.

C**Methodology**

INPUT used two research sources for this report. The first was a survey of vendors and current and potential users of systems operations, and the second was INPUT's annual survey of information services vendors. The first source was used to identify and compile data regarding current vendor and user views about systems operations. The second source was used to assist in establishing user expenditures for systems operations. This provided the base-year data for INPUT's forecast for systems operations.

Exhibit I-2 provides a summary of the respondents to the systems operations survey administered as part of this study. The 76 vendor respondents represented approximately 70% of the market revenue. Twenty (20) of these also completed in-depth interview questionnaires that probed market issues and management practices. The 36 user firms surveyed were distributed among existing users, firms that had evaluated systems operations but rejected it, and firms that had not yet considered it.

EXHIBIT I-2**Systems Operations Survey Respondents**

- 76 vendors
- 36 users or potential users
 - 19 current SO users
 - 2 former SO users
 - 9 had evaluated and rejected SO
 - 6 had not considered SO

The user sample was intentionally spread over all the vertical industry markets to try to identify general market characteristics but still recognize industry-specific issues.

INPUT's annual research process consists of two major parts: base-year expenditure calculations and market forecasts. Each is briefly described below.

1. Systems Operations Revenue Identification

Exhibit I-3 defines the structure of the information services industry as used by INPUT in its market analyses and forecasts. The market consists of eight delivery modes, each of which contains a number of submodes.

Vendors were questioned intensely to identify how their revenues were generated in each delivery mode. Care was taken to isolate processing services from professional services from systems operations. Only revenue judged by INPUT to be truly representative of systems operations activity was included in its estimates of vendor revenues for 1990.

2. Base-Year Expenditure Calculations

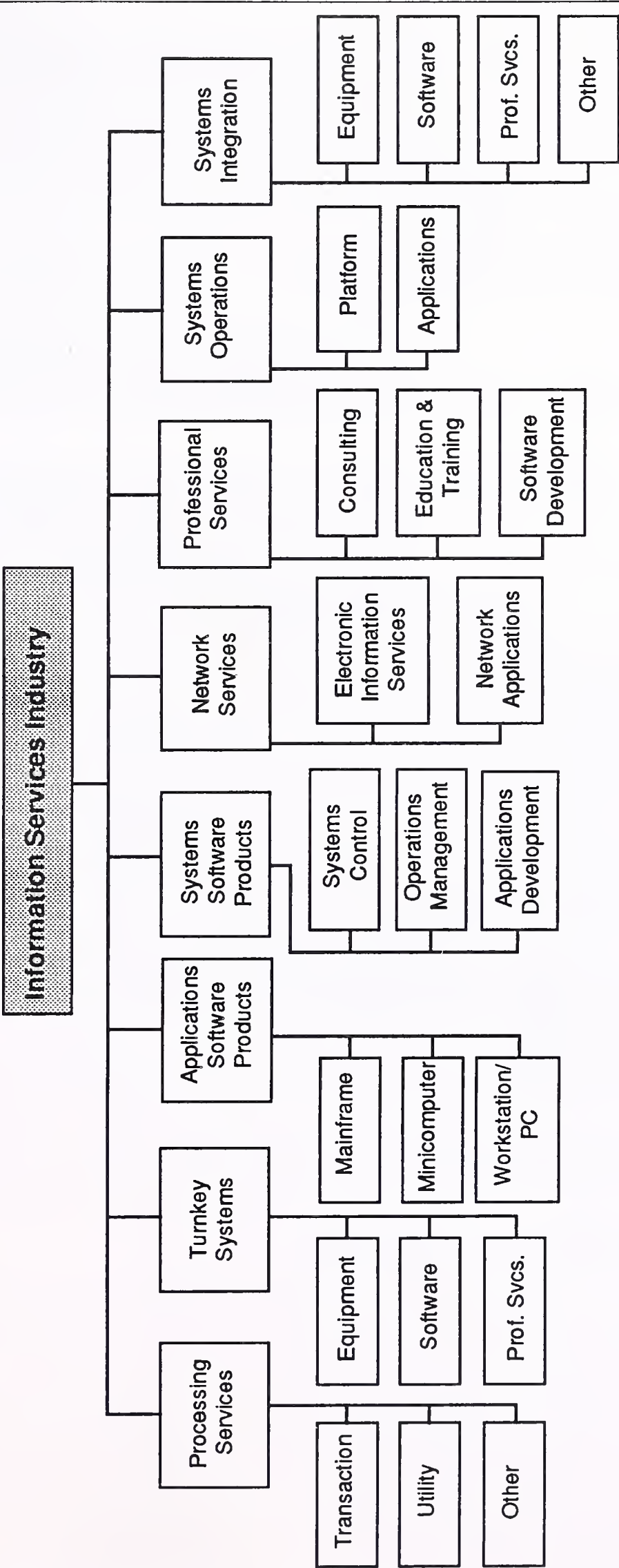
- INPUT determines previous-year information services revenues for the two systems operations delivery types and 15 vertical industry sectors for hundreds of vendors. This is accomplished through interviews, use of public data and INPUT estimates.
- The initial data is projected to represent the entire market, including all active vendors and hundreds of active customers.
- Adjustments are made to eliminate duplications due to distribution channel overlap and to assure that captive (internal) systems operations expenditures are not included.
- The end result is a base-year (1990) user expenditure for each of the 15 vertical industry sectors and the two systems operations types.

3. Market Forecasts

- In the forecasting step, INPUT surveys information systems executives to determine their projected expenditure levels, both in aggregate and for each of the outside information services categories.
- In addition, a second set of vendor interviews is conducted later in the year to obtain an understanding of how key vendors view the market and its opportunities.
- The end result is a five-year forecast for each of the 15 vertical markets and the two delivery types.

EXHIBIT I-3

Information Services Industry Structure—1991



To complete the process, INPUT reconciles its new forecasts with those from the previous year. Differences due to market restructuring and other causes are explained, providing users of these projections with the ability to track INPUT's forecasts from year to year.

D

Economic Assumptions

Forecast numbers are presented in current dollars (i.e., 1996 market sizes are in 1996 dollars). In developing the five-year forecast, INPUT has incorporated the following economic assumptions regarding the outlook for the total U.S. economy.

As shown in Exhibit I-4, Real GNP growth is currently projected to be slightly negative in 1991, then range from 2.2% to 2.7% over the next five years. In addition, the inflation rate, as measured by the GNP Deflator, is expected to decrease modestly from an annual rate of 4.1% in 1991 to 3.7% in 1996.

EXHIBIT I-4

Inflation/GNP Economic Assumptions (Percent)

	1990A	1991E	1992E	1993E	1994E	1995E	1996E	Avg. 90-95
Real GNP	0.9	0.1	2.7	2.8	2.6	2.2	2.5	2.0
GNP Deflator	4.1	3.9	3.6	3.9	3.9	3.8	3.7	3.8
Nominal GNP	9.0	3.8	6.3	6.7	6.5	6.0	6.2	5.7

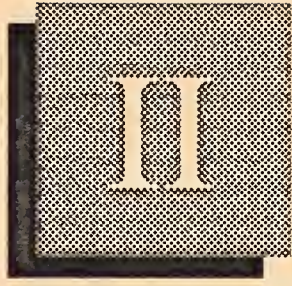
A = Actual E = Estimated

E

Related INPUT Reports

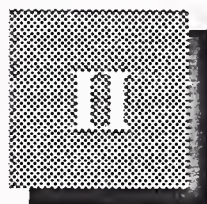
For a complete view of the information services market, readers are encouraged to review the following related INPUT reports:

- *Systems Operations—Growth for the 1990s* (1989)
- *U.S. Systems Operations Market, 1990-1995* (1990)
- *Federal Processing Services/Systems Operations Market, 1989-1994* (1988)
- *Systems Operations—Management Issues and Practices* (1990)
- *Network Operations Management* (1990)
- *Systems Operations Buyer Issues and Alternatives* (1991)
- *Systems Management Priorities and Directions* (1991)
- *Systems Operations Vendor Analysis* (1991)
- *U.S. Application Solutions Market, 1990-1995*
- *U.S. Processing Services Market, 1990-1995*
- *U.S. Systems Software Products Market, 1990-1995*
- *U.S. Professional Services Market, 1990-1995*



Executive Overview





Executive Overview

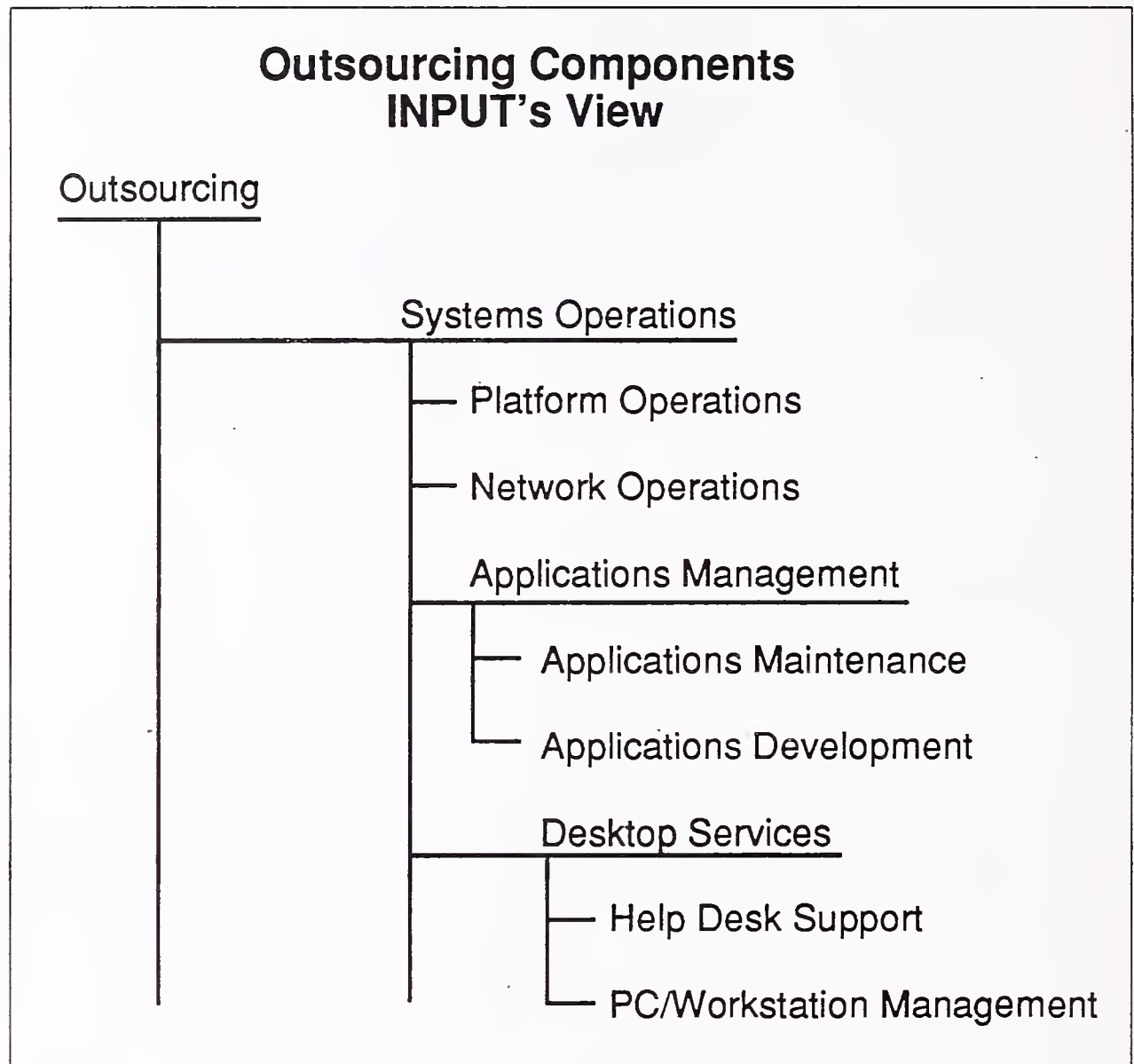
A

Outsourcing/Systems Operations

Outsourcing has become synonymous in much of the current literature with systems operations. INPUT defines outsourcing as the *contracting of all or a major part of an information systems process to an external vendor on a long-term basis*. The vendor takes responsibility for the performance of the process. Outsourcing is a method of acquiring a vendor to provide for existing operations, not a delivery mode. Within this framework, systems operations represents the major portion of the outsourcing market. It can include a variety of elements, as illustrated in Exhibit II-1. The client that chooses to procure only one of the elements is still outsourcing to a vendor.

All of the elements in the outsourcing category represent functions or processes that are performed, rather than projects that are accomplished. Platform operations and network operations are obviously functions upon which an organization depends for its survival. In the same vein, the maintenance and/or management of an organization's applications software is a function crucial to the successful accomplishment of its mission. Applications management can include applications development and/or applications maintenance. Finally, desktop services—which include such functions as the user help desk and the maintenance of workstations and PCs in the user environment—represent another function crucial to the daily operational efficiency of an organization.

EXHIBIT II-1

**B****Major Buyer Issues**

The buyer issues presented in Exhibit II-2 have been identified by user executives as the major issues that arise when considering the outsourcing of systems operations.

Many organizations face continuing pressure to reduce costs and preserve capital. The stagnant economy is causing even more firms to reassess how they can further reduce expenses and is changing the investment plans of many companies.

The market in which firms are operating continues to be extremely competitive as the shrinking consumer dollar must be courted by more firms, both domestic and foreign. Companies must serve their customers better and, in turn, they must get high-quality service from their IS departments.

Many companies are becoming convinced that outside vendors can provide a higher level of service than their own internal organizations. They often feel they have more leverage over a vendor's resources than over their own.

EXHIBIT II-2**Major Buyer Issues—1991**

- Reduce costs/conserve capital
- Improve service levels
- Resolve skills shortage
- Refocus executive attention
- Lose control to vendor

Constantly changing technology breeds two problems for the user community: not only is senior management finding it difficult to understand the new technology, but it is also finding it increasingly difficult to recruit staffs that can apply the new technology to meet competitive needs.

Senior executives in many firms need, more than ever, to focus attention on their core business, be that making cameras or selling hamburgers. Often, information systems are not considered part of that core business, but a part which, nonetheless, consumes a lot of executive time for the reasons cited above. Turning over systems operations to a vendor eliminates a major demand on executives' time.

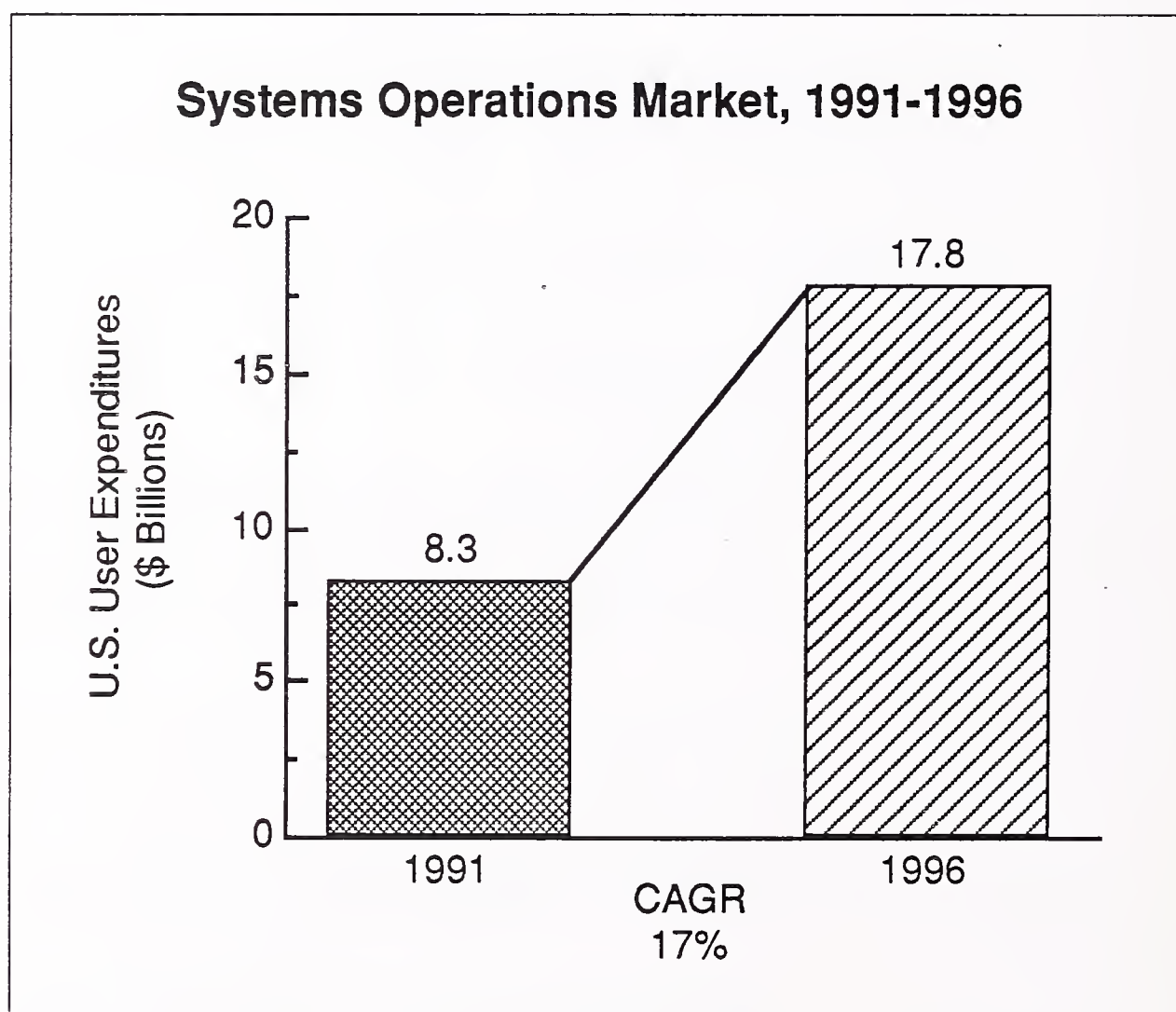
One major concern still troubles companies considering outsourcing. Many feel there is no turning back once they have turned their IS operations over to a vendor. They are probably right if they have not carefully planned to create a return path from the vendor. As the relationship between the vendor and the user organization gets more firmly established, the user becomes less capable of reassuming responsibility for IS operations. This is not necessarily bad, but the user must be aware that this is the route taken.

C

Market Forecast, 1991-1996

INPUT projects that user expenditures for systems operations will be \$8.3 billion for 1991 for the combined commercial and federal markets. Growing at a compound annual growth rate of 17%, these expenditures will reach \$17.8 billion in 1996, as illustrated in Exhibit II-3. This represents a slight increase in the growth rate over that reported last year and reflects the continued health of the market, increasing acceptance of the outsourcing option as a viable one, and improving economic conditions in the later years of the forecast.

EXHIBIT II-3



There continue to be major differences between conditions in the federal government and commercial markets. In the federal market, the emphasis on budget constraints and the recurring federal budget deficit are the overriding considerations. Defense budgets are being cut drastically, leading to consolidation of a number of information systems by the Pentagon. Federal government IS expenditures for 1991 are expected to be \$1.7 billion, growing to \$2.6 billion in 1996, for a compound annual growth rate of 9%—slightly lower than the 10% CAGR predicted last year.

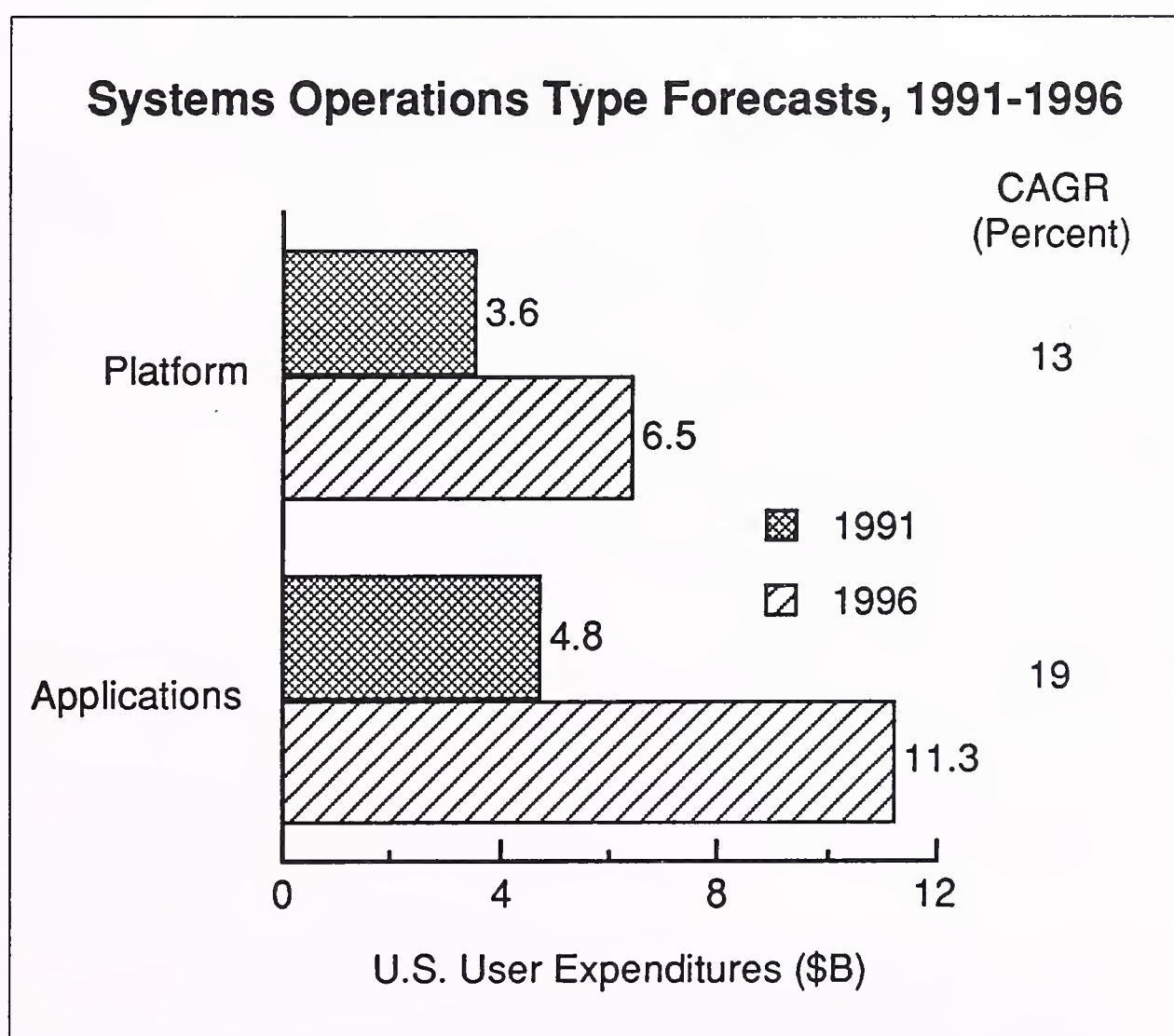
Interest in systems operations continues to increase in the commercial market, resulting in a compound annual growth of 18% for the period from 1991 to 1996—a slight increase over the 17% forecast last year by INPUT. Systems operations expenditures by commercial enterprises in 1991 are expected to be \$6.6 billion, growing to \$15.2 billion in 1996.

D

Systems Operations Components Forecast

Exhibit II-4 illustrates how the market is split between the two types of systems operations and how this spread will accelerate over the forecast period. In platform operations, the vendor is responsible for managing and operating the client's computer and/or communications systems. In applications operations, the vendor operates and manages the computer and/or communications operations and is also responsible for maintaining, or maintaining and developing, the client's applications systems.

EXHIBIT II-4



INPUT projects that applications systems operations, already the dominant mode, will grow at a compound annual growth rate of 19% through the period. Expenditures will grow from \$4.8 billion in 1991 to \$11.3 billion in 1996. Platform operations expenditures will grow from \$3.6 billion to \$6.5 billion in the same period, at a CAGR of 13%. The difference reflects the client community's greater acceptance of the concept of total systems management by vendors.

E

Forecast of Key Vertical Industry Sectors

Annual expenditures for systems operations services from 1991 to 1996 for the four leading industry market sectors are included in the table in Exhibit II-5. The industries are ranked based on projected 1996 user expenditures.

EXHIBIT II-5

Leading Vertical Industry Markets, 1991-1996

Industry	User Expenditures (\$ Billions)		CAGR (Percent)
	1991	1996	
Banking/Finance	2.0	4.7	18
Federal Government	1.7	2.6	9
State/Local Government	1.1	2.4	18
Health Services	0.9	2.0	18
Total	5.7	11.7	15

Ranked by 1996 user expenditures

As seen in the exhibit, the top four industries—banking and finance, federal government, state and local government, and health services—represent 67% of the expenditures in 1991 and 66% in 1996.

F

Vendor Market Share, 1990

Exhibit II-6 lists the leading systems operations vendors in 1990 based on reported annual revenues.

EXHIBIT II-6

Leading Systems Operations Vendors 1990

Vendor	Market Share (Percent)
EDS	14
CSC	6
Systematics	3
IBM	2
ACS	3
SMS	2
SIAC*	2

*Securities Industries Automation Corporation

This year IBM appears on the list for the first time. The restructuring of its SO efforts into the ISSC subsidiary has resulted in new revenue, plus a redistribution of revenues that were counted in other revenue categories.

CSC obtained most of its revenues from the federal market, but its recent win of the General Dynamics contract will change that next year. However, EDS is still more widely dispersed across various vertical industries. The other firms in the list specialize in three or fewer industries and have demonstrated strength within their markets.

G

Client Selection Process

The vendor and the client must develop a clear understanding of each others' capabilities and commitments before a real systems operations contract can be entered into. It is a grueling task for both the vendor's marketing force and the prospect's evaluators.

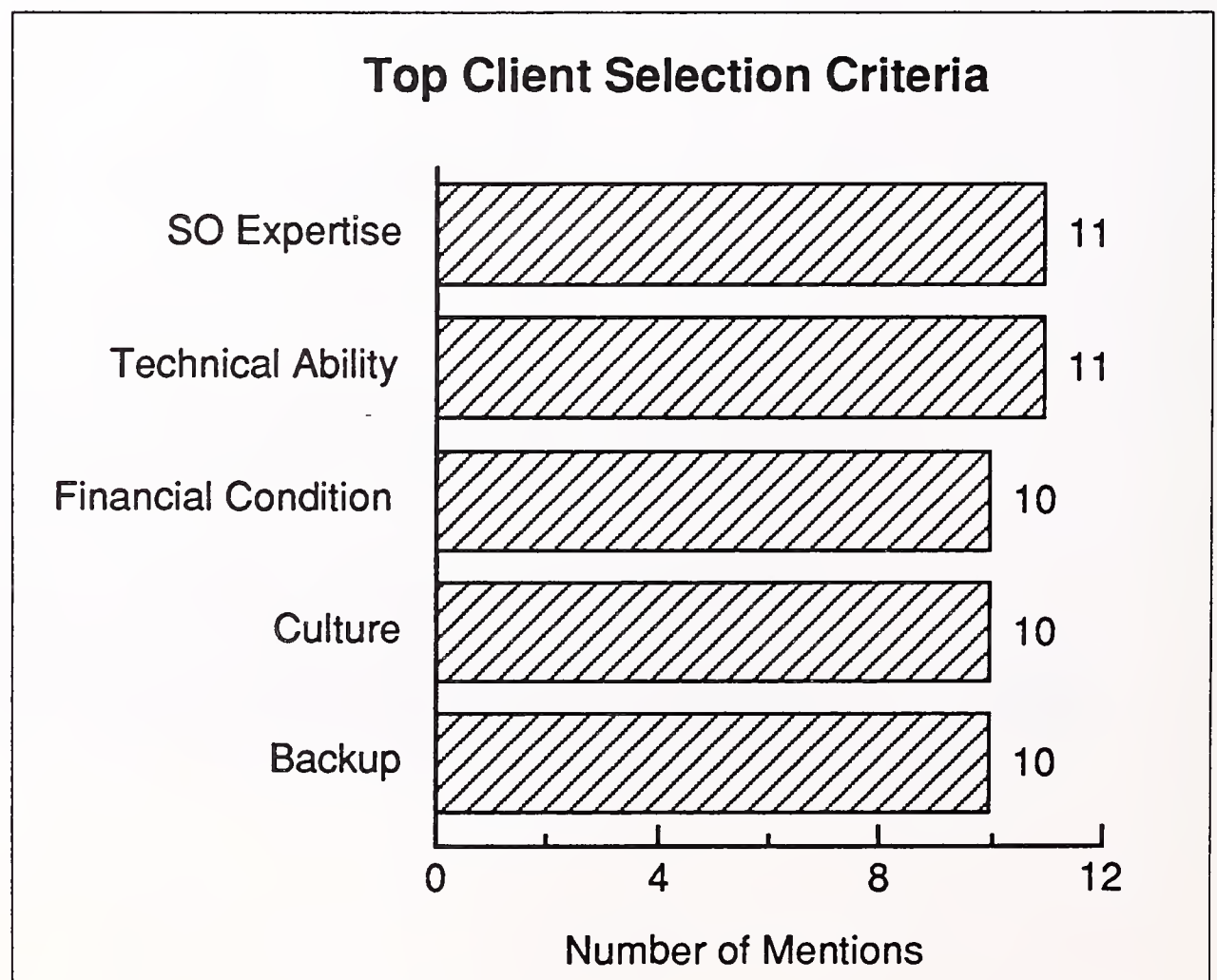
Fifty percent (50%) of the prospects interviewed by INPUT prepared a formal solicitation document. The prospect's purpose is to provide vendors with common data upon which to base their proposals.

The other firms simply assembled their requirement data and notified known vendors or current suppliers that they were looking for an external systems operations management arrangement.

The selection process is essentially a screening process. The first set of responding vendors is narrowed down to a smaller, more viable short list through a preliminary evaluation. This usually involves a comparison of some common criteria. The short list of vendors is then reviewed more thoroughly and discussions are typically begun with several vendors.

Certain vendor capabilities repeatedly appeared on selection criteria. Exhibit II-7 presents the data on the number of times the major evaluation criteria were mentioned by the respondents to an earlier INPUT study.

EXHIBIT II-7



The most frequently mentioned items were the related criteria, systems operations experience and technical ability. Note that experience was defined as prior systems operations experience. Buyers wanted to entrust their data processing centers to experienced hands, not to new players in the game.

The next most frequently mentioned items included the financial stability of the prospective vendor. Buyers are looking for some assurance that the selected vendor will be a viable provider for the long term. For that reason they weigh the financial condition of the vendor heavily as an important characteristic.

Several other selection criteria were less frequently mentioned by respondents to INPUT's user survey. A more thorough discussion of these less important items can be found in INPUT's report, *Systems Operations Buyer Issues and Alternatives*.

H

Recommendations

The set of recommendations presented in Exhibit II-8 is derived from the analysis of the market this study represents.

These recommendations reflect the conditions as they exist in the present marketplace. They incorporate the issues raised by users and the strategies successfully demonstrated by vendors.

EXHIBIT II-8



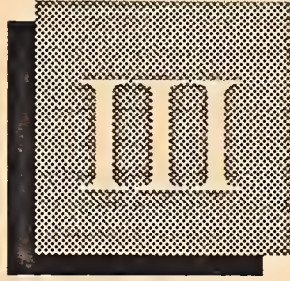
The key recommendations to be made for the pre-sales cycle are:

- Select prospects carefully. Capitalize on existing knowledge and relationships in the target industry.
- Enhance credibility by demonstrating prior success, either with that prospect or within the prospect's industry.
- Capitalize on long-term pre-existing relationships with the prospect, who feels that such a relationship is, indeed, the best choice for him.
- Establish strong alliances with partners that can supplement industry expertise and provide additional cost-effective resources.
- Understand that the vendor will need to assume some financial risk, usually involving a capital investment or assumption of some of the client's assets.
- Develop contractual terms that protect against undue risk for both parties.

The key factors of the post-sale period need to be considered from the onset of the sales cycle, also. They are:

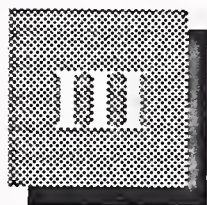
- Vendors must communicate within the client's organization with both user and senior management, on a daily basis if necessary.
- Vendor personnel need to become part of the client's organization providing a better service level than that provided by the internal staff.
- The formal contract will need to be supplemented by both parties agreeing that the good of the partnership will often require actions not specifically written in the contract.
- The vendor and client must have joint strategy sessions at which important issues can be discussed and key information shared.

Vendors that successfully master the development of partnerships will be the major systems operations/outsourcing vendors that benefit most from this expanding market segment.



Market Analysis and Forecast





Market Analysis and Forecast

More and more organizations choose to contract with systems operations vendors for the management of their data processing operations. Some of these organizations are also turning to the same vendors for applications software maintenance and management. The vendors have become more aggressive in assuming financial risks by assimilating such client assets as hardware and staff, when that is warranted. Vendors are acquiring competitors or complementary firms to improve their market positions.

This chapter will examine the general market characteristics, position systems operations in the outsourcing equation, then discuss the types of systems operations and the differences between the commercial and the federal market. It will then present forecasts of the systems operations market overall, by operations type, and by vertical industry market. Finally, the key marketplace factors and the competitive environment will be reviewed. The result will be a comprehensive view of the current market and the trends affecting its performance in the forecast period.

A

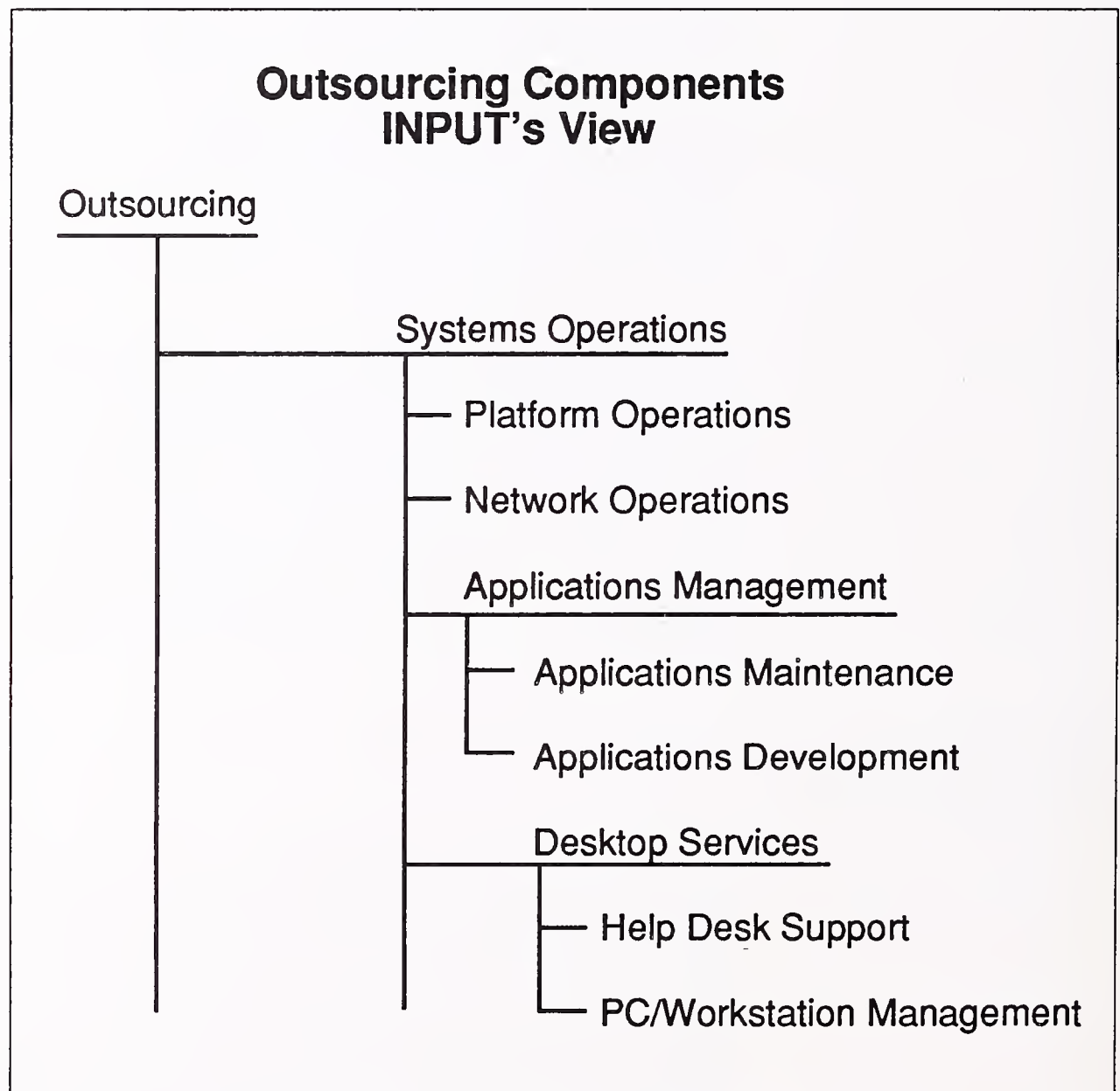
Market Structure

Systems operations still represents the major portion of the outsourcing market, as defined by INPUT. The market components will be examined in detail to determine how the market is changing and to identify opportunities that these changes present to the aggressive vendor. A fast-changing environment is anticipated, since outsourcing represents a change in the method of contracting for existing functions rather than the creation of a demand for new functions. This analysis is designed to help vendors better understand the changes and capitalize on them.

1. Systems Operations and Outsourcing

Outsourcing has become synonymous in much of the current literature with systems operations. This has led to much confusion. INPUT defines outsourcing as the *contracting of all or a major part of an information systems process to an external vendor on a long-term basis*. The vendor takes responsibility for the performance of the process. Outsourcing is a method of acquiring a vendor to provide for existing operations, not a delivery mode. Within this framework, systems operations is one delivery mode that can be acquired through outsourcing. It can include a variety of elements, as illustrated in Exhibit III-1. The client that chooses to procure only one of the elements is still outsourcing to a vendor.

EXHIBIT III-1



All of the elements in the outsourcing category represent functions or processes that are performed, rather than projects that are accomplished. Platform operations and network operations are obviously functions that an organization depends on for its survival. In the same vein, the maintenance and/or management of an organization's applications software is

crucial to the successful accomplishment of its mission. Applications management can include both applications development and/or applications maintenance. Finally, desktop services, which include such functions as the user help desk and the maintenance of workstations and PCs in the user environment, are another crucial function to the daily operational efficiency of an organization.

2. General Market Characteristics

The outsourcing relationship between client and vendor is taking on the aspects of a true partnership. The contract is typically for a term longer than one year. The price is predictable over that term, and the vendor personnel often become an integral part of the client's organization.

More and more of the support functions are being outsourced to vendors, running the gamut from providing the entire data processing platform to even operating the help desk and maintaining the workstation/PC inventory for the client.

To operate in this environment, vendors have become more willing to form alliances with other suppliers and partnerships with the client that provide the best combination of services to that client. They assume responsibility for the client staff whenever that is warranted. Flexibility is the key operating word.

Clients, for their part, accept the vendor staff as a part of their own operations and formulate plans with the vendor personnel actively participating in the process. The we/they relationship may still exist, but the professionalism demonstrated by the vendor's staff has convinced most IS managers who have outsourced their operations that they made the right decision.

a. Environmental Factors

The conditions that fostered a sudden spurt of growth in the systems operations market about two years ago still exist. Though the economy is beginning to recover, that recovery ranges from slow to minuscule in certain geographic areas. Many firms that suffered reduced revenues and profits because of this have consolidated their operations. They are still looking for more cost-effective ways of operating; they don't expect boom times to return soon. Exhibit III-2 summarizes these factors.

EXHIBIT III-2

**Systems Operations
Environmental Factors**

- Economic adjustments continue
- Global market growth
- Rapidly changing technology
- Corporate restructuring/merging

Firms that because of cost pressures or consolidation problems have already chosen to outsource their systems operations have done so successfully. Other organizations in their vertical industry market have taken note and are now seriously looking at the viability of the systems operations option for their own organizations. Where there once had been strong skepticism about outsourcing, there now is at least guarded interest.

The rate of technological change continues to be rapid. IS executives want to apply these new technologies as effectively as possible. Adoption of some new technologies can greatly improve a firm's competitive position. However, many organizations lack the internal resources needed to understand and implement new technologies. Systems operations vendors are a viable alternative to this skill shortage. As major IS suppliers, vendors can more easily recruit and retain the top talent needed to stay abreast of technological developments. They can share this talent with their clients and leverage the expertise the client firms cannot acquire and retain internally.

The technological issue is further complicated by the increasing scope of the global business community. As markets expand across national borders, corporate management puts more demands on the IS organization's processing and communications infrastructure. Many of the major SO vendors have a wealth of experience in international IS markets. This experience can be applied to the client's IS needs much more effectively than if the client tries to do it alone.

Systems operations vendors provide a hedge against technological obsolescence at a lower cost in executive time. They provide a better cost alternative to in-house operations in times when cash flow is critical and when the global market introduces additional complexity to already challenging IS problems. Vendors and buyers have crafted the systems operations relationship into a vehicle well suited to current business conditions.

b. Partnership Evolution

The relationship between vendor and client in the systems operations environment is one which, of necessity, evolves over time. The long-term nature of the contract terms, coupled with the need for intense vendor involvement in the client's business issues, adds an extra incentive to actions to make the partnership work.

Many current systems operations clients, in response to INPUT inquiries, indicate that the original SO contract bears no resemblance to the conditions under which they are currently operating. It is difficult to predict future needs of the client organizations. Clients and vendors have had to make changes that made good sense for both parties. The two key words that explain the relationship between vendor and client are *flexibility* and *professionalism*. Both parties must be willing to adjust their operating modes. Clients must understand the impact of their change requests on the vendor staff. Both groups must demonstrate constant professionalism in their day-to-day relationships.

As this new relationship develops, new management techniques evolve to account for the demands of the changing environment. Chapter V, Section E will discuss this further.

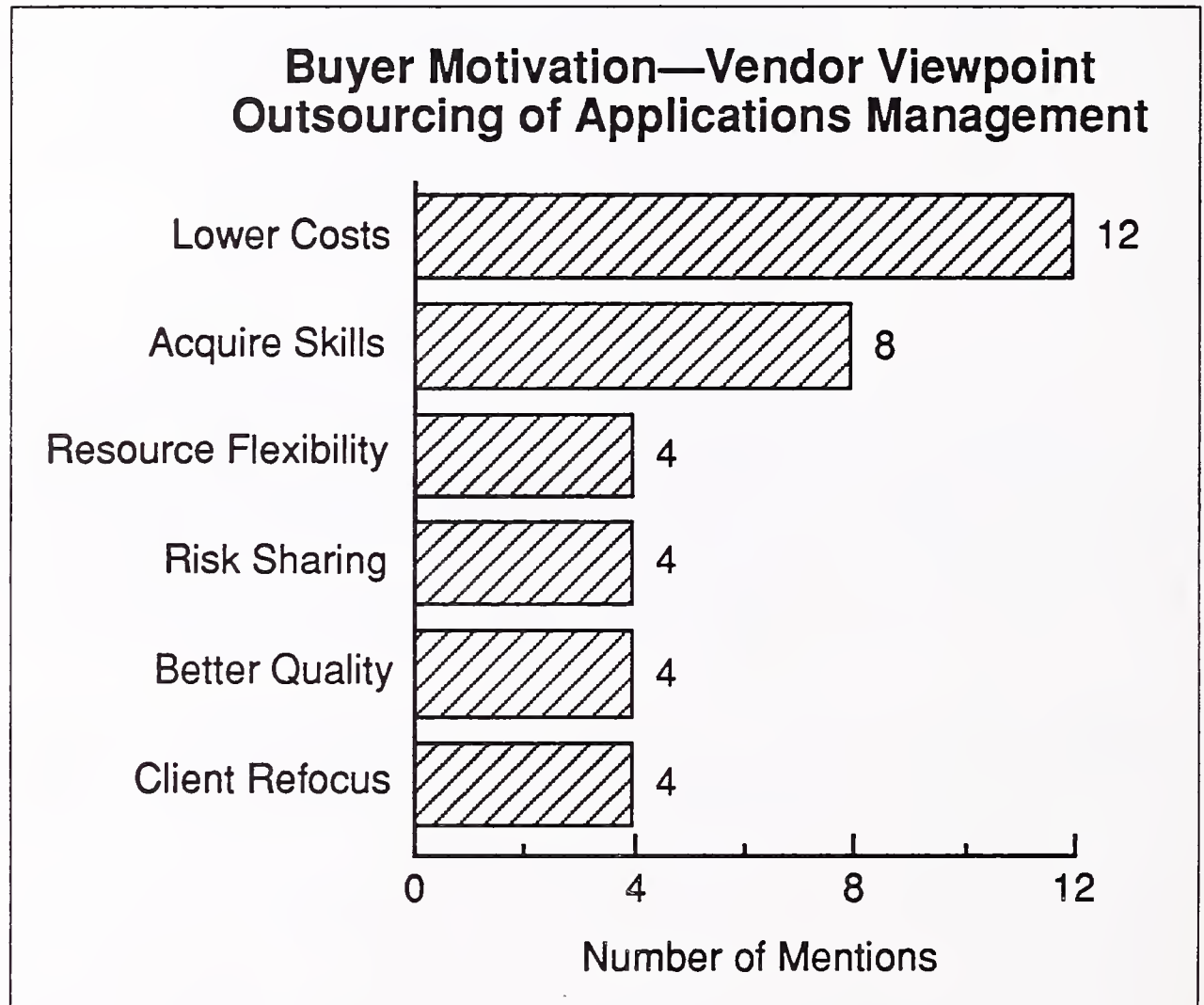
c. Applications Management

More clients are choosing to outsource their applications software, as well as the processing of those applications, to a vendor. This can mean that the vendor is responsible for maintenance of the applications software, or the client may turn over both applications software maintenance and development to the vendor.

This trend is expected to accelerate in the period from 1991 to 1996, as client confidence in the vendor community increases. Those same clients are finding it increasingly difficult to acquire the internal skills necessary to meet user requirements in an increasingly sophisticated technological environment.

The buyer motivations for outsourcing, in general, will be discussed in Section C1 of this chapter. The vendors' perceptions of why buyers are turning specifically to them for applications management are illustrated in Exhibit III-3. Heading the list, in the vendors' view, is the opportunity to reduce costs. Vendors believe they can maintain and develop software more cost effectively than clients and feel this message is being accepted by clients. The more cost-efficient environment is a function of access to better development tools and the ability of the vendor to leverage highly skilled resources across several clients' requirements.

EXHIBIT III-3



Clients and prospects are finding it increasingly difficult to acquire some of the skilled personnel they need to provide superior applications software support. Vendors have the same problem but they have two advantages in recruiting such personnel. First, they can offer higher pay scales to systems analysts and programmers. Next, they offer a more attractive, challenging career path to the technical resources, since their function is information services.

The next four factors, though mentioned less frequently than the cost and skills issues, represent interesting attitudes on the part of the vendors. There is no doubt that a client buys a great deal of flexibility when depending on the vendor for applications development, at least in terms of

staff. Clients need not plan to balance the development load but can call for the software development resources, on an as-needed basis, to meet changing user requirements. By passing responsibility for software development cycles to the vendor, the client also shares the risk for late delivery and the impact of software delays on operating costs. Thus, if the vendor doesn't deliver on time, the client may acquire additional resources to get the job done, without any increase in staff cost to the client.

Vendors are convinced they can deliver a better quality of software support to the client. As we shall see later in this chapter, it is no longer simply a good marketing line; clients are also choosing outsourcing to improve the quality of their information services. Finally, vendors are citing clients' wishes to refocus their attention on their core businesses. The outsourcing of applications software development allows them to do this.

The above are sound reasons for outsourcing applications development. These market forces should continue to accelerate the rate of outsourcing of applications software maintenance and development to vendors.

3. Systems Operations Types

A distinction must be made between the differences in operating environments that exist in the two systems operation types. In a platform systems operations environment, the vendor is responsible for the processing component of the information services provided to the organization. The client retains control over the applications software, for both maintenance and development purposes. In an applications systems operations environment, the client turns over all applications software maintenance and development to the vendor, as well as the processing component of the information services operation. Exhibit III-4 summarizes the environments.

EXHIBIT III-4

Systems Operations/Outsourcing Environments	
Platform	Applications
Vendor does processing/communications Client does applications software management	Vendor does processing/communications Vendor does applications software management

4. Vertical Industry Markets

INPUT has identified 15 vertical industry markets for information services. Each has a set of driving forces and characteristics. These will be discussed at some length in Chapter IV of this report. Exhibit III-5 identifies the 15 vertical industry markets used by INPUT to segment the information services market.

EXHIBIT III-5

Fifteen Industry-Specific Markets

- | | |
|--------------------------|-----------------------------|
| • Discrete Manufacturing | • Insurance |
| • Process Manufacturing | • Health Services |
| • Transportation | • State & Local Governments |
| • Utilities | • Federal Government |
| • Telecommunications | • Business Services |
| • Wholesale Distribution | • Education |
| • Retail Distribution | • Miscellaneous Industries |
| • Banking & Finance | |

B

Market Forecasts, 1991-1996

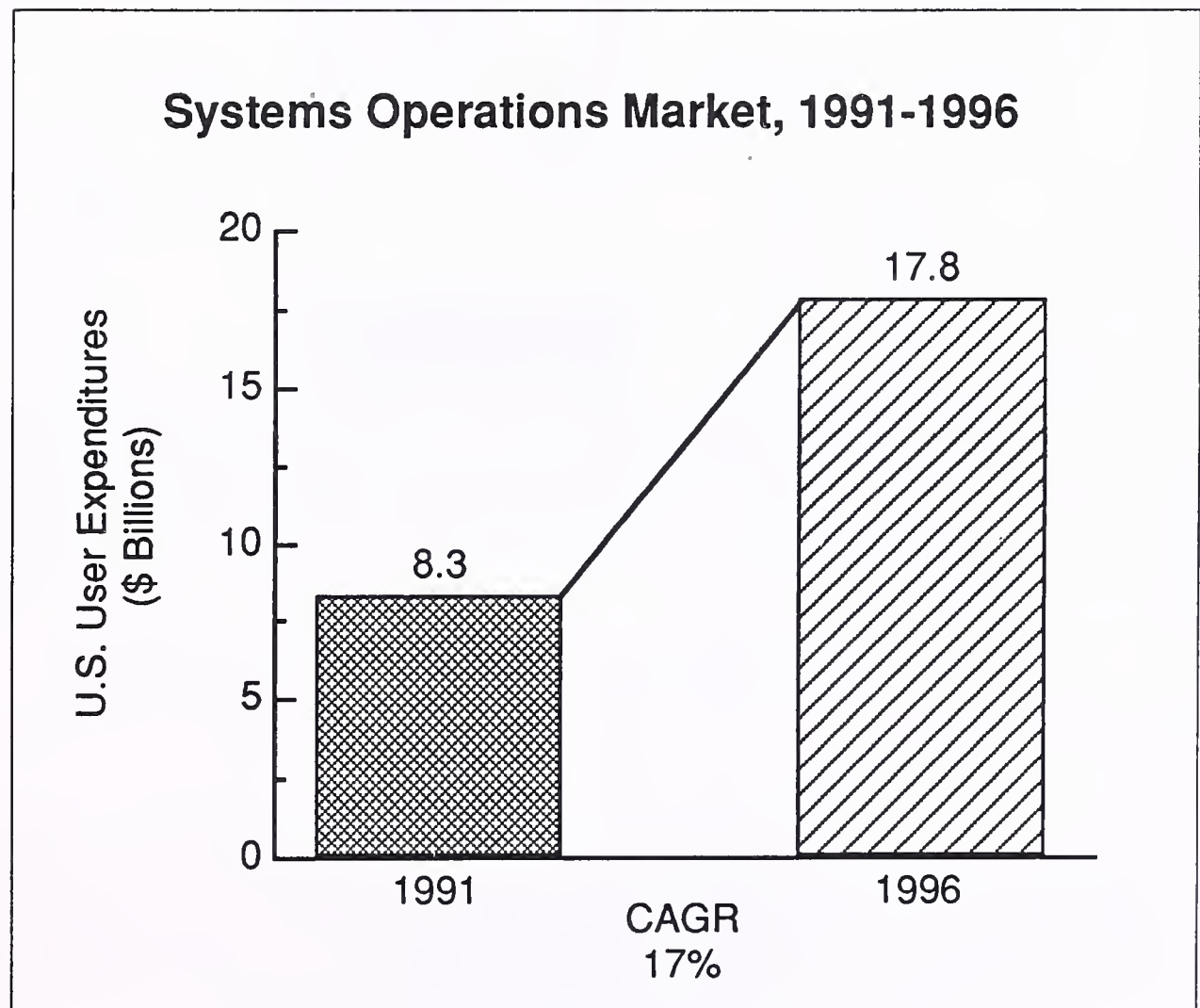
The systems operations forecast is provided in annual user expenditures. The forecast is limited to actual user expenditures for systems operations contracts. The user expenditures for services provided within these contracts to plan, manage, operate, fix and enhance clients' applications and to operate and repair information and telecommunications equipment are included. Client expenditures on equipment that it will own, but that is operated by an SO vendor, are not included.

Systems operations activities included in systems integration contracts are presented in INPUT's systems integration forecast and excluded from the systems operations forecast. Follow-on systems operations contracts, awarded after the initial systems integration contract has been completed, are included in this forecast.

1. Systems Operations Market, 1991-1996

INPUT projects that user expenditures for systems operations will be \$8.3 billion for 1991 for the combined commercial and federal markets. Growing at a compound annual growth rate of 17%, these expenditures will reach \$17.8 billion in 1996, as illustrated in Exhibit III-6. This represents a slight increase in the growth rate over that reported last year and reflects the continued health of the market, increasing acceptance of the outsourcing option as a viable one, and improving economic conditions in the later years of the forecast.

EXHIBIT III-6

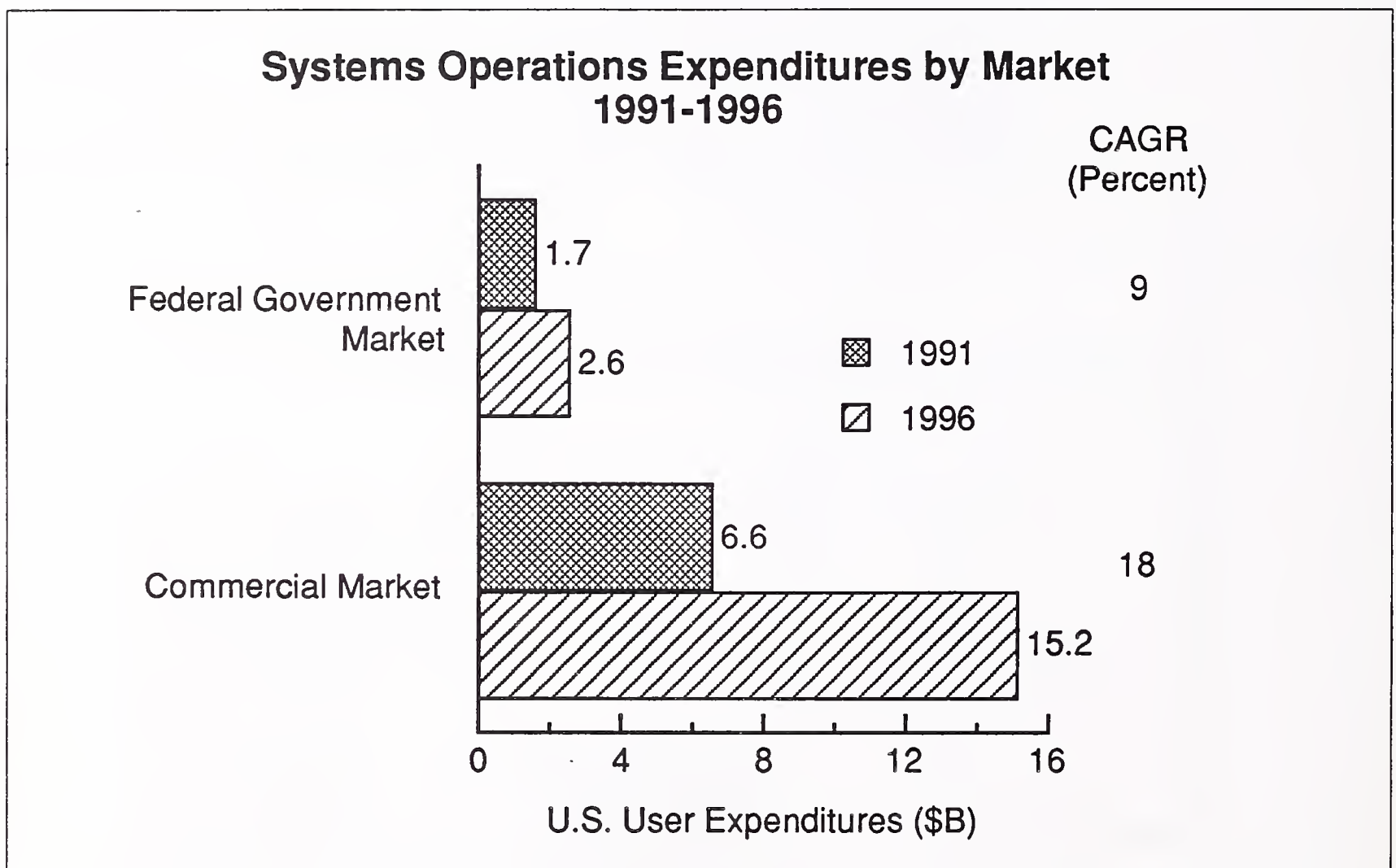


2. Commercial versus Federal Systems Operations Market Forecasts

Exhibit III-7 illustrates that there continue to be major differences in conditions in the federal government and commercial markets. In the federal market, the emphasis on budget constraints and the recurring federal budget deficit are the overriding considerations. Defense budgets

are being cut drastically, leading to consolidation of a number of information systems by the Pentagon. The civilian agencies may benefit in the long run, as their budgets may actually increase over time. The net effect is still sluggish growth. The 1991 federal government expenditures are expected to be \$1.7 billion, growing to \$2.6 billion in 1996, for a compound annual growth of 9%—slightly lower than the 10% CAGR predicted last year.

EXHIBIT III-7

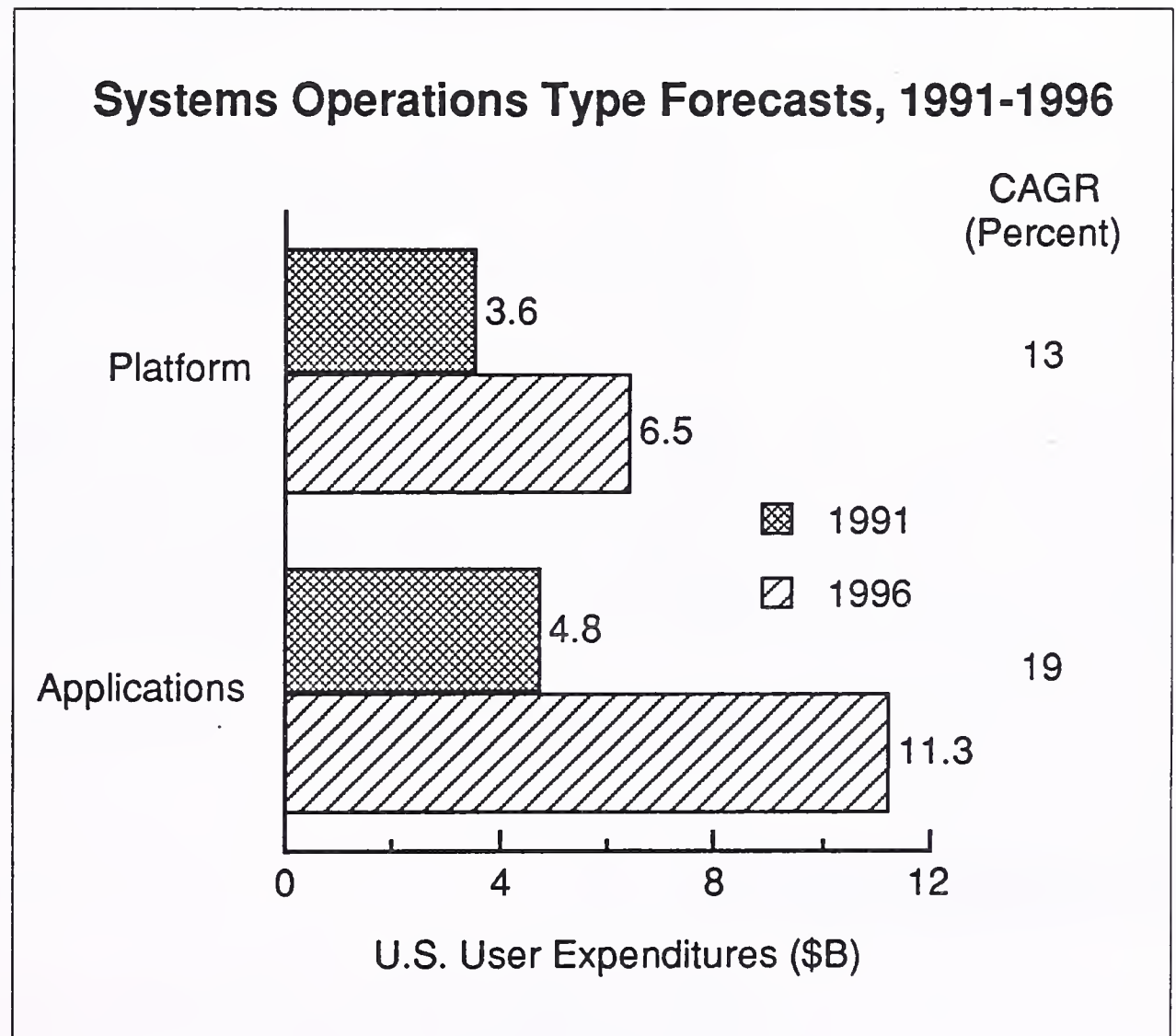


Interest in systems operations continues to increase in the commercial market, resulting in a compound annual growth of 18% for the period 1991 to 1996—a slight increase over the 17% forecast last year by INPUT. Systems operations expenditures by commercial enterprises in 1991 are expected to be \$6.6 billion, growing to \$15.2 billion in 1996. The continued sluggish economic recovery and troubles in the banking market have actually spurred interest in the outsourcing option as a means of preserving capital and improving cash flow. The insurance and retail distribution industries are currently experiencing similar financial trauma.

3. Systems Operations Forecast by Operation Type, 1991-1996

Exhibit III-8 illustrates how the market is split between the two types of systems operations and how this spread will accelerate over the forecast period. In platform operations, the vendor is responsible for managing and operating the client's computer and/or communications systems. In applications operations, the vendor operates and manages the computer and/or communications operations and is also responsible for maintaining, or maintaining and developing, the client's applications systems.

EXHIBIT III-8



INPUT projects that applications systems operations, already the dominant mode, will grow at a compound annual growth rate of 19% through the period. Expenditures will grow from \$4.8 billion in 1991 to \$11.3 billion in 1996. Platform operations expenditures will grow from \$3.6 billion to \$6.5 billion in the same period, at a CAGR of 13%. The difference reflects greater acceptance in the client community of the concept of total systems management by vendors.

4. Forecast by Vertical Industry

The annual expenditures for systems operations for 1991 and 1996 for the 14 commercial vertical markets and the federal government are illustrated in Exhibit III-9. The compound annual growth rate for the period is shown in the right-hand column. The industries are ranked in order of projected 1996 user expenditures. As seen in the exhibit, the top four markets are banking and finance, the federal government, state and local governments, and health services. These are the same top four markets as reported last year, though the federal government and the state and local government categories have exchanged rankings.

Growth rates substantially above the average will occur in the retail distribution and business services markets. In the first case, this represents both the reaction of the clients to financial hard times in their industry and an aggressive entry into the market by IBM's ISSC subsidiary. In the business services industry, some strong activity by EDS in the travel and hospitality reservation business accounts for the expected growth.

The federal government and education markets continue to demonstrate the least growth. Both of these markets are suffering from major budget limitations that will affect them for the next few years. Note that state and local government markets are projected to grow at the commercial market rate. This market has reached a point at which expenditures cannot be delayed any longer if the demand for new services is to be met.

A more detailed analysis of each vertical industry market is presented in Chapter IV of this report.

C

Key Marketplace Factors

INPUT surveyed users and vendors in the systems operations market to identify the factors that most influence the growth and direction of that market. The research identified some important decision factors in the buyers' selection criteria that will influence how the service will evolve. Vendors' approaches to acquiring systems operations clients are shaped by what they perceive to be the buyers' wants. However, vendors must also find creative, cost-effective approaches to providing the required services in order to remain cost-competitive, while continuing to provide superior service that enhances their reputations in the marketplace.

EXHIBIT III-9

Market Forecast by Vertical Industry, 1991 and 1996

Industry	User Expenditures (\$ Billions)		CAGR (Percent)
	1991	1996	
Banking/Finance	2.0	4.7	18
Federal Government	1.7	2.6	9
State/Local Government	1.1	2.4	18
Health Services	0.9	2.0	18
Insurance	0.9	1.9	16
Discrete Manufacturing	0.6	1.4	20
Process Manufacturing	0.5	1.1	20
Retail Distribution	0.2	0.6	25
Transportation	0.1	0.4	20
Business Services	0.1	0.3	22
Wholesale Distribution	0.1	0.2	18*
Education	0.1	0.2	13*
Telecommunications	0.1	0.2	19
Utilities	0.03	0.06	14
Miscellaneous	0.02	0.04	15

*CAGR difference due to rounding of expenditures

1. Buyer Motivations

A key part of INPUT's annual systems operations market analysis is a user survey that assesses how the attitudes of the user are changing toward systems operations. INPUT asked those who were outsourcing what they saw as benefits. Exhibit III-10 presents the results for 1991 and compares the rankings from INPUT's 1990 survey.

EXHIBIT III-10

Buyer Motivation		
	Ranking	
	1991	1990
Reduce operating costs	1	2
Improve service levels	2	5
Refocus executive attention	3	8
Supplement internal skills	4	7
Provide flexibility/response	5	6
Acquire new technology	6	NM
Guarantee critical systems	NM	1
Preserve capital	NM	3
Enhance security/privacy	NM	4

NM = Not mentioned

The incentive to reduce operating costs has become the highest ranked item. In fact, the item on the top of the list last year—the desire to guarantee critical systems by turning them over to a vendor—was not mentioned this year. Last year it was both a reason for outsourcing and one for not outsourcing. This year it is only a reason for not outsourcing, as can be seen in Exhibit III-11.

The desire to improve service levels has jumped from number 5 to number 2 this year, indicating that users are beginning to believe that vendors are providing a high-quality service—often better than they can provide internally.

Another factor that jumped up in the scale is the opportunity that outsourcing provides to executive management to refocus its attention on core business rather than on IS problems.

Users still see the vendor as a good source of scarce technical resources in an increasingly tight labor market. The vendor is also viewed as more able to react to changing business conditions, thus providing the opportunity to change requirements rapidly and respond to changes in a professional manner. The next item was new this year. The outsourcing vendor was seen as providing the opportunity to gain access to new technology more easily than if the operations were retained internally.

Three items that were mentioned in last year's survey were not even mentioned this year. We already mentioned the issue of the criticality of systems. It is more logical that users who consider their systems critical to their operations would be reluctant to outsource them. Last year's high ranking of this factor may have been an aberration.

The benefit of preserving capital was not mentioned either, though some of the respondents who referred to the top-ranked item, reducing costs, may have included that in their considerations. Finally, where some respondents last year felt that outsourcing enhanced the security of their systems by relocating them off-premises, this item was not mentioned in this year's responses.

For a balanced view, the INPUT survey included some users of outsourcing services and some who had decided not to outsource. The reasons the latter rejected outsourcing are listed in Exhibit III-11.

Though cost savings was the greatest incentive for outsourcing, it was decided by another group of evaluators that outsourcing provided no substantial cost savings. This is a perfectly understandable position, given the wide range of operating efficiencies in the IS community.

Running a close second, however, was the issue of loss of control. Many respondents fear that loss of control will occur when a vendor takes over the systems operations function. A related inhibitor is the consideration that systems are too critical to turn over to a vendor. Respondents feared they would lose their competitive advantage if they relinquished control, particularly the development of certain systems, to vendors.

EXHIBIT III-11

Reasons for Not Outsourcing

Reason	Rank
No cost advantage	1
Loss of control	2
Operation too critical	3
Inflexible contract terms	4
Loss of responsiveness	5
Difficult to project cost/needs	5 (tied)

Less frequently mentioned items include the concern that contract terms are too inflexible and that the vendor may be less responsive than the internal system. Finally there was a concern that it is too difficult to project cost and growth requirements to develop a valid agreement. These last reasons sound like reasons given by someone who can't really justify not outsourcing but has a strong emotional aversion to it.

Prospects will become buyers when the incentives to outsource are strong enough to overcome inherent emotional resistance to losing control. The strongest incentives are often economic ones, though technological complexity is becoming more important, both because skilled resources are harder to find and because it is harder to understand the impact of the technology on the user's effectiveness.

2. Vendor Strategies

Exhibit III-12 summarizes emerging vendor strategies. Vendors present themselves to prospects as able to provide the full range of services required currently and in the future. They have created further incentives by entering into equity investment arrangements with the client that immediately improve the organization's cash flow and reduce its capital requirements.

EXHIBIT III-12

Systems Operations Vendor Strategies

- Provide financial incentives
- Form ad hoc alliances
- Target transition situations
- Concentrate on known markets
- Develop risk containment strategies

Vendors continue to seek clients in markets in which they can capitalize on their previous experience. For example, since IBM has a good reputation in the retail industry, it was able to score three quick successes in that market—with Zale Corporation, Cullum Companies and Supermarkets General Corporation. Vendors also continue to target companies in transition, those that are in financial straits or have recently been involved in a merger or acquisition. The opportunity for immediate cash benefit is particularly appealing to this group of prospects.

As the market matures, vendors continue to hone their professionalism. They benefit from early experiences to craft business arrangements more advantageous to both parties. Many are applying risk containment strategies to their operations to ensure that they remain profitable in the long term and can live up to their fixed-cost agreements with the clients.

3. Market Drivers

The systems operations market is being driven by a number of positive and negative factors. Exhibit III-13 summarizes factors that are stimulating growth of the market.

The positive driving forces can be split into two categories. The first set represents the economic and business environment, the second represents technological factors.

EXHIBIT III-13

Systems Operations Driving Forces

- Core business focus
- Business transition
- Expense reduction
- Capital preservation
- Increasing complexity
- Scarcity of talents
- Vendor capabilities

From the business side, there continues to be an increasing incentive for management to concentrate on the organization's core business. In many cases, the information processing function is not considered part of that core function. There is increasing willingness to "leave it to the experts"—thus providing an opportunity for outsourcing vendors.

Some of these same organizations feel the pressure to concentrate on the core business because they are in a transition period. They are trying to digest the result of recent merger or acquisition activities or are considering downsizing their operations because of changing economic conditions. The ongoing economic slowdown continues to force organizations to constantly review their expenses and capital investments. They are seeking to reduce both of these significantly. Outsourcing of systems operations can positively impact the bottom line by reducing short-term expenses and preserving capital for alternative investment purposes.

There is a series of technological factors that also have a strong, positive impact on the market. The technology that firms need to maintain a competitive edge, domestically and in the global marketplace, gets more and more complex. If a firm needs to expand its coverage to an additional ten countries as its market expands, communications challenges need to be met. If a sales organization needs instant access to market and product availability data, the latest data base technology has to be in place.

As the technical demands become more complex, the skilled resources needed to solve those problems are harder to find and retain. Vendors provide a valuable resource pool for these scarce talents, particularly those that are not required full time by the client organization. Those same vendors are improving their capabilities as they gain experience and acquire staff and processing capacity. The positive track records of most vendors and the string of successes to which they can point, particularly in such demanding markets as the banking industry, are making the outsourcing of systems operations a much more appealing alternative for management.

Exhibit III-14 illustrates that negative market factors do exist, however, to temper the effect of the positive drivers. Many prospective firms are still uncomfortable about being dependent on an outside vendor for such a critical function as information services. There is a sense that they are losing control over a vital function. As they look further into the future they realize that it will be difficult to reverse the decision to outsource should the experience not be successful. There is, indeed, a high probability that the vendor/user relationship will be a permanent one, since the user will become less familiar with IT technology as the contract evolves. All of these decisions are difficult, unless the management has decided that information services is not the business in which it wants to be.

EXHIBIT III-14

Systems Operations Market Inhibitors

- Dependency on vendor
- Reversing the decision
- Savings uncertainty
- Service quality
- Organizational threats

Remember that, in most cases, the prospect only makes the decision to outsource systems operations one time. Prospects have no experience base from which to assess how much can be saved or how the service quality will be from the vendor. This level of uncertainty can only be reduced by second-hand accounts from other firms already outsourcing

their operations and from the assurances of the vendor. In addition, any major change, such as the outsourcing of systems operations, poses a major organizational threat that must be addressed by the firm's management. That threat is felt particularly by the IS organization. However, users of the services in the rest of the organization may also feel uncomfortable that a service will be provided from a remote site.

The net effect, however, is that the systems operations market is being positively affected by the combined market forces, resulting in a healthy growth rate for the five-year period.

D

Competitive Environment

The great diversity of clients in the systems operations marketplace is easily matched by the wide variety of systems operations vendors. Professional services organizations, equipment manufacturers, processing services firms, and industry specialists have entered the market. In some cases, they have expanded their industry coverage in order to gain market share. To better understand the mechanics of the market, INPUT divides it into the categories shown in Exhibit III-15.

1. Vendor Categories

It is useful to subdivide systems operations vendors into categories based on their origins or their recognized specialties. Certain broad generalizations can be made about each class that help predict how they approach the systems operations market.

Most of the firms with a long history in processing services continue to provide platform operations. They only take over applications software when the client asks them to do so. EDS is the exception to this rule, however. As the market leader, it heads the surge into applications systems operations, just as it was an early leader in investing in the client's business by acquiring staff and data centers.

Professional services firms are more comfortable providing staff functions, as well as processing capacity. The degree of account control provided is an attractive benefit for the vendor. The larger professional services firms operate in a number of vertical markets, wherever they have built up expertise. The smaller ones may concentrate in only one or two markets, such as SCT in the education and state government markets.

EXHIBIT III-15

Vendor Categories

Type	Examples	
Processing Services Firms	EDS	ACS Commercial Services
	Genix	Boeing Computer Services Litton Computer Services
Professional Services Firms	Andersen Consulting	Systems Computing & Technology
	SAIC	
	Systemhouse	CSC
Equipment Vendors	IBM DEC	Unisys
Software Vendors	Sterling Software	American Management Systems
Industry Specialists	Mellon Bank	Agway
	Covia	Systematics
	Fiserv	Shared Medical Systems

The two equipment vendors that are actively trying to penetrate the systems operations/outsourcing market are IBM and DEC. They have extensive resources to apply to the task. IBM, through its subsidiary ISSC, has demonstrated that IT market presence may help in the SO market as well. Both vendors appear to be serious, though DEC may be more inclined toward the systems integration market.

Software vendors have not penetrated this market to any great extent, often because they do not have the processing assets in place to get started in this market. INPUT does not expect much penetration from this set of vendors.

Industry specialists are those who bring special industry expertise to their client base. Most of them include proprietary software in their service offerings and are, therefore, providers of applications systems operations. They have thrived in their respective industry markets and show signs of continuing to grow at or above the current market growth rate.

2. Leading Systems Operations Vendors, 1990

IBM appears on the list, for the first time, this year. The restructuring of its SO efforts into the ISSC subsidiary has resulted in new revenue, plus a redistribution of revenues that were counted in other revenue categories. IBM is also taking a very aggressive stance to acquire business in markets it already knows well.

Another look at the vendor mix is presented in Exhibit III-16. To be a dominant vendor, it helps to be a multi-industry vendor. However, there is opportunity for an industry specialist to capture a significant share of revenue. Both EDS and IBM are active across several industries. CSC obtains most of its revenues from the federal market, but EDS is much more widely dispersed. The other firms on the list specialize in three or fewer industries and have demonstrated significant strength within their markets.

EXHIBIT III-16

Leading Systems Operations Vendors 1990

Vendor	Market Share (Percent)
EDS	14
CSC	6
Systematics	3
IBM	2
ACS	3
SMS	2
SIAC*	2

*Securities Industries Automation Corporation

3. Recent Vendor Activity

The aggressive posture the major vendors have taken and the renewed interest of some of the more traditional vendors reflect the health of the systems operations market.

a. Acquisitions

CSC continues to buy assets, such as Compusource and Paragon Consulting, that complement its existing resources and better position it for further penetration into the commercial market. That goal came closer to reality with the recent win of the General Dynamics contract, the largest single outsourcing contract ever awarded (\$3 billion).

Flserv bought Citicorp Information Services from Citicorp last year to expand its activity from that of a processing and software vendor to that of a full-service vendor. Most of the outsourcing activity is still managed by the former Citicorp management team.

b. Client Buy-Ins

EDS continues to grow by acquiring client assets, including gaining a strong position in the travel, reservations and hospitality industries with major contracts at Continental Airlines, National Rental Car and Hospital-ity Franchise, respectively. EDS also acquires assets of complementary firms, such as McDonnell Douglas IS, when that strengthens its position in a particular market.

Of course, two of the earlier examples of client buy-ins are the acquisition of the Sun Refining and Marketing Corporation data center in Dallas by Andersen Consulting and the assumption of Kodak's processing facilities by IBM.

c. Other Major Activity

IBM's move to establish a subsidiary to aggressively pursue opportunities in this market is a strong signal that it views systems operations and outsourcing as a high-potential market with acceptable margins.

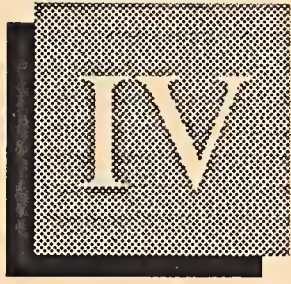
The Integrated Systems Solutions Corporation has begun the race at a fast pace, capitalizing on its strength in the retail industry and the banking market to score some impressive early wins.

Other vendors continue to aggressively pursue their market opportunities also:

- Power Computing surprised many by winning a major contract with EPIC Healthcare. Until that time, Power had not been a factor in the health services industry.

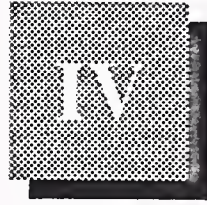
- Systems and Technology Corp. continues to quietly operate in the education market. It demonstrated last year that there is life in that market by winning a \$42 million contract with George Washington University.
- Andersen Consulting's surprising alliance with Systematics, just announced, may signal a change in the strategic approach for Andersen, but can only be good news for Systematics.
- The DEC/Kodak relationship took a significant turn this year, as DEC began assuming responsibility, not only for Kodak's domestic network operations, but also the international network communications operations of the photographic giant.

This level of activity is indicative of a healthy market environment. The types of activity represent major new wins for a variety of vendors and both consolidation and expansion of capabilities by the organizations active in the market.



Vertical Industry Markets





Vertical Industry Markets

Each vertical market has characteristics that impact market opportunities and that vendors must understand for effective market penetration. This section discusses the forces at play in each vertical industry, and identifies the key issues in each of them. The discussion leads to an assessment of the potential within each market for systems operations vendors, followed by a forecast for the vertical industry for the period 1991 to 1996.

A brief description of the types of enterprises that INPUT includes in each vertical market is included at the beginning of each discussion. Often the mix of companies varies greatly, both in size and market impact. The discussion about the vertical industry generally focuses on companies that are most prominent in that industry.

The discussion of industry forces reflects research on economic trends identified in that sector. The current economic state, the growth rate of business in that sector, the demographic change in establishments, and the changing demands in the market served may all be factors influencing information technology decisions.

An assessment of the impact of these economic forces on information systems and services redirects focus to the information services executives' viewpoint. A better analysis of the buyer motivators in each vertical market is possible when factors influencing the outsourcing decision are well understood.

The potential in each vertical market is directly influenced by the economic forces at play. For example, an industry in difficult financial straits may be a better target for systems operations vendors because reducing current expenses or preserving capital may be overriding considerations.

In another case, deregulation may have launched intense competition that makes a systems operations vendor's industry expertise attractive for the less well-funded prospects. Still other companies may need to leap-frog to a new technology platform to stay competitive. In reviewing the characteristics of a vertical industry, both the motivators and the inhibitors to entry into that industry will be identified.

The assessment of potential leads directly to a forecast for each vertical industry market. All of the forces discussed above are considered in identifying and evaluating the industry. The short-term effects can cause a change that has a lasting effect on the market. On the other hand, growth patterns may take some time to develop if strong inhibitors exist in a given market.

A complete review of market potential by vertical industry must include identification of the major vendors in that market. This information allows prospective systems operations vendors to assess their chances in that particular vertical industry. Is the competition too tough? Is the entry requirement a higher level of industry knowledge than is currently available in the vendor's organization? Can alliances be used to supplement internal resources?

A

Banking and Finance Industry

This sector covers four major areas: commercial banks, thrifts, security and commodity brokerages, and other financial services. The latter encompasses credit unions, mortgage banks, cooperatives, and personal and industrial financial institutions. Insurance is discussed as a separate vertical industry sector.

1. Industry Forces

Major changes in the current financial environment created trends that affect the industry's image and methods of doing business. These changes include: deregulation, the thrift crisis, and the decline in value of commercial real estate.

One of the greatest factors affecting most U.S. banks is the drastic decline of commercial real estate. In 1990, commercial banks increased reserves and restricted their lending in fear of bad loans made on real estate. Money centers also felt the effects of bad real estate loans as well as loans made on less-developed countries (LDCs).

The thrift crisis continued with the Resolution Trust Corporation moving to clean up insolvent S&Ls. The total number of thrift institutions taken on by the Resolution Trust Corporation through 1990 reached roughly half of the 3,200 that existed as solvent institutions in 1988. Although recessionary effects appear to be weakening, effects of the recession could cause this number to grow still larger as real estate investments continue to lose value.

The principal industry reactions include extension of functions into multiple business lines, acquisitions and mergers, and new offerings of individual products and services. The industry goal is full relationship-based banking, with brokerage services, investment advice, money markets and other non-traditional services all available to the customer. All of these directly affect the structure and function of information processing.

Among the impacts on the financial services sector has been an apparent interest in returning to basic values. One aspect of the interest in full-relationship banking has been a growing interest in branch-office automation.

Following years of developing sophisticated (centralized) systems, many banks are focusing on returning to community (branch-office) banking. This return is affecting information systems in various ways, as described below.

2. Impact on Information Systems and Services

Consolidation has continued in the banking industry—motivated, on the one hand, by declining profitability of commercial banks and on the other by the crisis in the savings and loan industry.

Consolidations and the demand for an increasing range of services put enormous stress on in-house IS staff. Highly specialized experience is needed for short periods, which may not be available in small institutions. The average life cycle of systems is becoming shorter, so that more frequent upgrade or replacement is essential.

Financial managers need more information and supporting analyses to make the decisions that will keep their firms competitive. Portfolio and credit services require customer services and account managers to interact with most of the previously independent departments of financial institutions.

Distributed data processing will need to operate with central data processing applications, employing standardized network protocols and systems architecture. New systems must provide PC user interfaces for access to central computer facilities to allow combining of office tasks, financial processing and service analyses by a single manager.

Expansion of access to a widening range of internal data by users and customers increases the demand for data management. Control, integrity and security of frequently sensitive data are major concerns of banking and financial management.

Demands for greater cost control, improved profitability, and improved customer service continue to place strains on the information systems staff. One key result of these demands is for an increasing acceptance of the outsourcing of systems operations as an effective alternative to internal management of the changing IS environments.

3. Systems Operations Potential

The potential for systems operations in banking/financial institutions has increased from the previous year. It is still the largest single projected user expenditure over the 1991-1996 period. The positive and negative external pressures on information systems and services are listed in Exhibit IV-1.

EXHIBIT IV-1

Key Factors in Banking/Finance Industry

- Positive
 - Accelerated consolidation of commercial banking operations
 - Continued savings and loan retrenchment
 - Strong cost pressures dominant
 - Less resistance to outsourcing
- Negative
 - Strong internal staff in large banks
 - Unique industry knowledge required
 - Complex multi-hardware environment growing

The continued search by the Resolution Trust Corporation for effective ways to maintain the operating assets of ailing savings and loan institutions has meant good opportunities for several systems operations vendors. As these continue to surface, new opportunities arise in commercial banking because of the increased pace of mergers in that sector. Some of the largest mergers will not be likely candidates for systems operations vendors, however, unless the vendor can assimilate large number of excess staff. In the case of the Bank of New England/Fleet Norstar acquisition, for example, approximately 2,000 employees in IS and operations were laid off.

On a more positive note, the continued success of some vendors in the banking market has created a band wagon effect that has reduced resistance to outsourcing in the banking market. In a community known for its extensive executive network, the news of one success spreads rapidly and makes it easier for the next CIO/CFO to choose outsourcing as an alternative.

Demand continues to develop for complex communications solutions to manage the telecommunications networks of individual components of the new corporate entities being formed by mergers and acquisitions in the commercial banking sector. Communications technology with lower error rates is particularly important as financial companies extend their electronic transactions across the country and around the world. National networks of ATMs and debit cards are a competitive necessity. Systems operations services have to fit within this complex environment. While manageable in mid-sized banks, this can be a serious challenge in the largest banks.

Applications software packages continue to be in demand in this industry. The availability of vendor-developed and -maintained products are attractive to mid-sized banks that are overwhelmed by applications development and maintenance requirements. The recent alliance between Andersen Consulting and Systematics is one indication that vendors are paying attention to user demands.

The banking/finance industry requires highly sophisticated industry-specific knowledge for successful systems operations management. Those vendors that are able to combine advanced technology with industry-specific applications knowledge will be successful. Vendors targeting the larger banking/financial services institutions must be in a position to demonstrate proven capabilities and to overcome entrenched operations organizations.

4. Systems Operations Forecast

Savings and loan problems, consolidations in commercial banking, and a major downturn in real estate activity all served as a brake on the IS banking market in general. The systems operations sector continued to grow at a steady rate, however, because each IS dollar must be more effectively spent. Systems operations provides an avenue to affect cost savings, according to users interviewed, so more financial institutions will be evaluating and contracting for outsourcing even as the entire market slows down.

Exhibit IV-2 illustrates how the systems operations market will grow at an 18% CAGR in the period 1991-1996. That growth rate will cause user expenditures to increase from \$2.0 billion in 1991 to \$4.7 billion in 1996. That represents a large increase in absolute dollar expenditures though the base of expenditures is already so high that the percentage of growth rate is only slightly above the overall systems operations market growth rate of 17%.

EXHIBIT IV-2

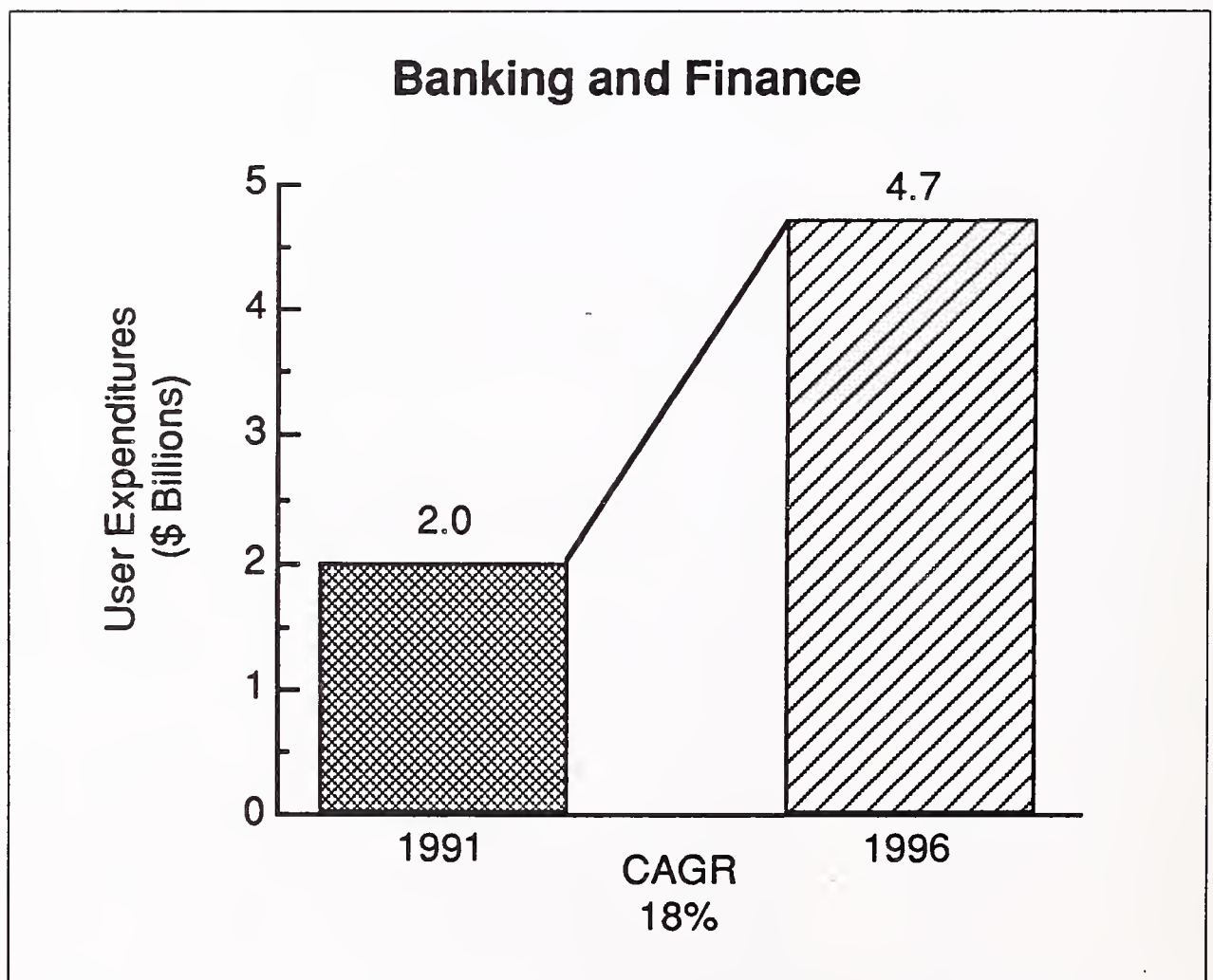
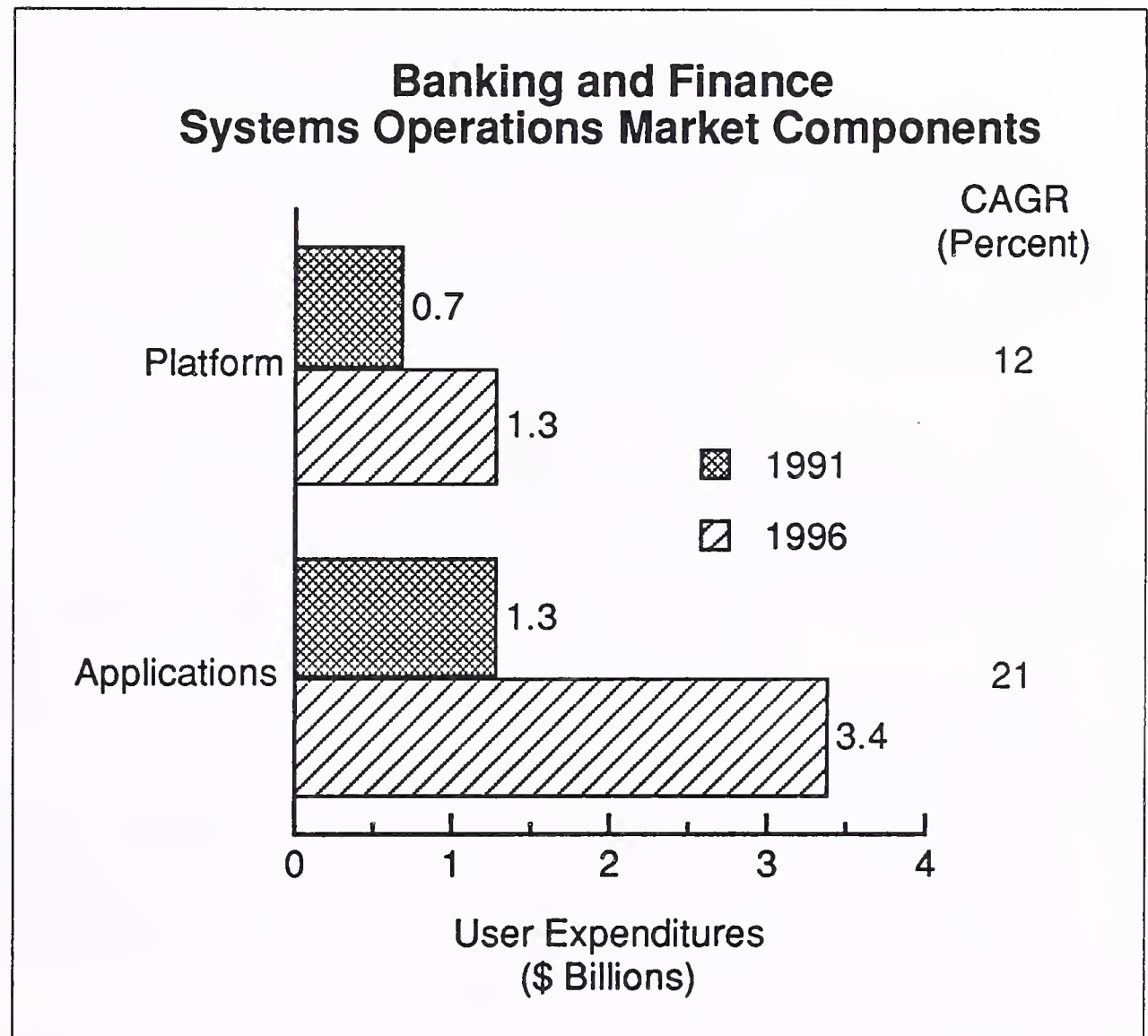


Exhibit IV-3 presents the forecast for the banking and finance industry in terms of applications and platform operations over the 1991-1996 period. Applications processing represents more than 65% of this vertical industry's systems operations expenditures in 1991, and this increases to 72% by 1996. INPUT attributes this to a growing sophistication in the SO vendor community about banking applications and the desire of prospects to improve software effectiveness as they consolidate operations.

EXHIBIT IV-3



The banking and finance sector is serviced by two types of vendors. Broad market players such as IBM, EDS, and Andersen Consulting are mentioned frequently by bank IS managers as potential system operations vendors. EDS and IBM have scored major contract wins in the past. Andersen, less prominent in the banking community, has re-engineered the operations of a major Chicago bank and has just announced a marketing alliance with Systematics. Prominent also are the vendors that specialize in this market segment, such as Mellon Bank, Systematics, SEI, FIserv and FFMC. These specialized vendors should retain a large portion of this market because of their in-depth knowledge of the business and propri-

etary banking software offerings. The broader-based vendors are positioning themselves to provide the lowest operating costs. They also appeal to their prospects with promises to stay abreast of technology and enhance the operating environment as part of the contractual agreement.

B

Federal Government

This sector includes defense and civilian departments, independent agencies, and public corporations, but excludes weapons, platforms, and classified applications, such as embedded computer systems, intelligence, and tactical command and control systems.

1. Industry Forces

The U.S. and the federal government are being impacted by a range of forces that make the future more difficult to forecast. The net effect of the forces discussed below is a pronounced reduction in the growth rate of federal spending in a number of subsectors, some of which directly affect prospects for the information industry.

The military establishment is facing a substantial reduction with the cessation of the Cold War and democratization of the Eastern European countries and the U.S.S.R. However, strategic policy changes, including arms reduction, will be delayed by difficult political choices.

The war with Iraq altered the picture still more. The generally effective performance of high technology, leading to a dramatically successful conclusion, has re-invigorated sales efforts to the Defense Department. Further, the FY 1992 defense budget request shows significant increases in most IS-related categories. It is not clear how the Congress will react to this budget request.

The U.S. trade imbalance continues to depress the value of the dollar, although recent reductions in the trade deficit, and interest rate cuts in Japan and Germany, have led to a strengthening of the dollar. Continued farm subsidies will impact budget reduction moves. The continuing depression of the real estate market, unregulated investments by S&L banks, and the inability to buy back junk bonds for leveraged buyouts have fueled a downward spiral of the economy. Economists agree that the U.S., and much of the world economy, is in the midst of a recession of uncertain duration. Business cutbacks and failures will appear as lost tax dollars, severely retarding any federal budget support.

The current administration has not developed an effective campaign for resolving mounting domestic issues. Federal resources cannot adequately address the problems without threatening federal government fiscal health. In addition, the recession has pushed many state and local governments into both budget cuts and tax increases. The 1991 joint budget package to reduce the deficit over the next five years actually increased taxes, with no significant expenditure reduction except to block the effectiveness of the Gramm-Rudman-Hollings Act.

2. Impact on Information Systems and Services

Federal IS budgets aim toward greater functionality of information resources. Most IS organizations are committed to maintaining high-quality support of their agencies, but continually face rising service-level demands, obsolescence of resources, and rising maintenance costs. A major share of existing software was custom-developed by contractors and in-house staffs to satisfy applications that have since been extensively modified.

Hardware and software maintenance will continue to impact the availability of IS staff to do new applications development and to staff internal projects. Demands for technical assistance to end users equipped with PCs or advanced workstations are also reducing staff availability for new projects.

The government is in transition—from collecting and processing incredible volumes of data to the presentation of more readily understood information to support decisions. IS needs to readily acquire, store, and permit access to the enormous collection of information essential to agency operations and the public. Industry standards, like POSIX and GOSIP, support this transition, enabling interoperability and compatibility. Standardization of communications protocols and system interfaces is likely.

Another evolutionary but frequently debated government process is the acquisition method used for information systems and services. Risk containment and cost control needs support increased use of fixed-price contracts and closer scrutiny of procurements by vendors and oversight agencies. The Defense Department and other agencies impacted by protest delays are pressing for utilization of commercial buying practices. However, to date, they have made little progress.

3. Systems Operations Potential

As mentioned earlier, the federal government employed systems operations vendors early on. The terms GOCO (government-owned, contractor-operated) and COCO (contractor-owned, contractor-operated) were used in this market to describe examples of facilities management contracts.

Those terms have now been replaced by the term *mission contracting*, which describes the environment in which a vendor assumes total responsibility for an agency's data processing operation, or at least the operations for a major process or function within that agency.

The lack of skilled technical staff in the government sector has long been attributed to the gap in pay scales between the federal sector and commercial enterprises. This problem makes systems operations an attractive alternative for agencies looking to upgrade and enhance their IS capabilities to better serve the public, which is requiring more and more services.

Exhibit IV-4 presents these positive factors as well as some negative market factors. Budget restrictions continue to plague the procurement plans of the agencies and cause significant uncertainty as to what projects will actually be funded. The problem is particularly acute in the DoD segments of the market. Defense budgets are being cut back drastically and a number of major systems procurements are being consolidated or delayed. On the civilian agency side, the defense budget cut may actually generate more funds for use on SO projects, but that is several years in the future.

EXHIBIT IV-4

Key Factors in Federal Government Market

- Positive
 - Mission contracting
 - Technical staff shortages
 - Service demand increases
- Negative
 - Long-term uncertainty
 - Deficit-limited budget
 - Systems integration impact
 - Extended implementation schedules

Not only is Congress asking more questions prior to procurement, the vendors themselves are protesting many procurements after award, thanks to the Competition in Contracting Act and the adversarial environment it has created. These post-procurement protests have greatly lengthened the procurement cycles in the federal sector. This, in turn, makes it more expensive to bid in this market.

4. Systems Operations Forecast

The forecast for this sector has been reduced again from last year's figure of 10%, because of the uncertain climate mentioned above. The new projected growth rate for the period 1991-1996 is 9%. This will result in a projected revenue of \$1.7 billion in 1991, growing to \$2.6 billion in 1996—still enough to make this market segment the third largest in 1996. This is illustrated in Exhibit IV-5.

EXHIBIT IV-5

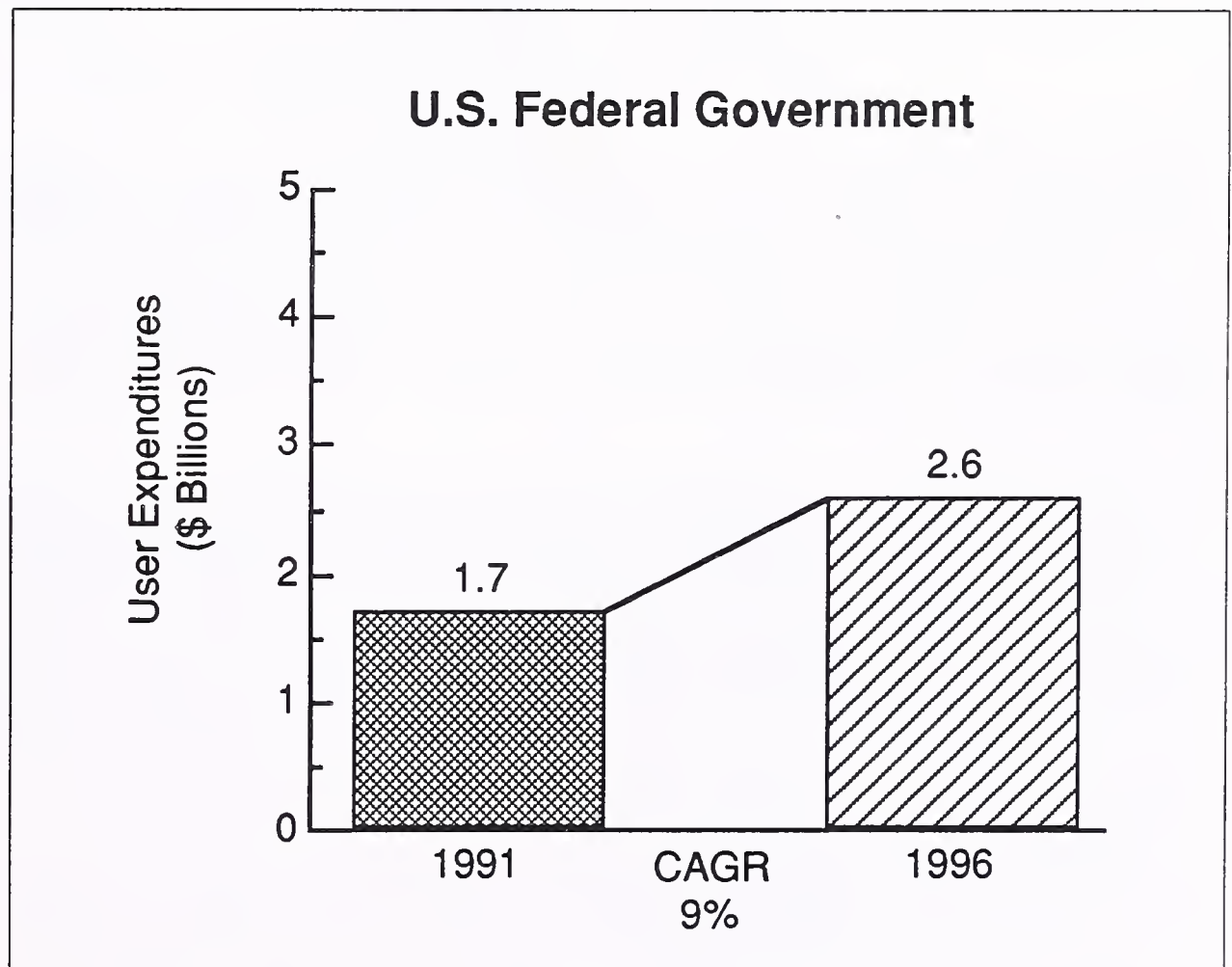
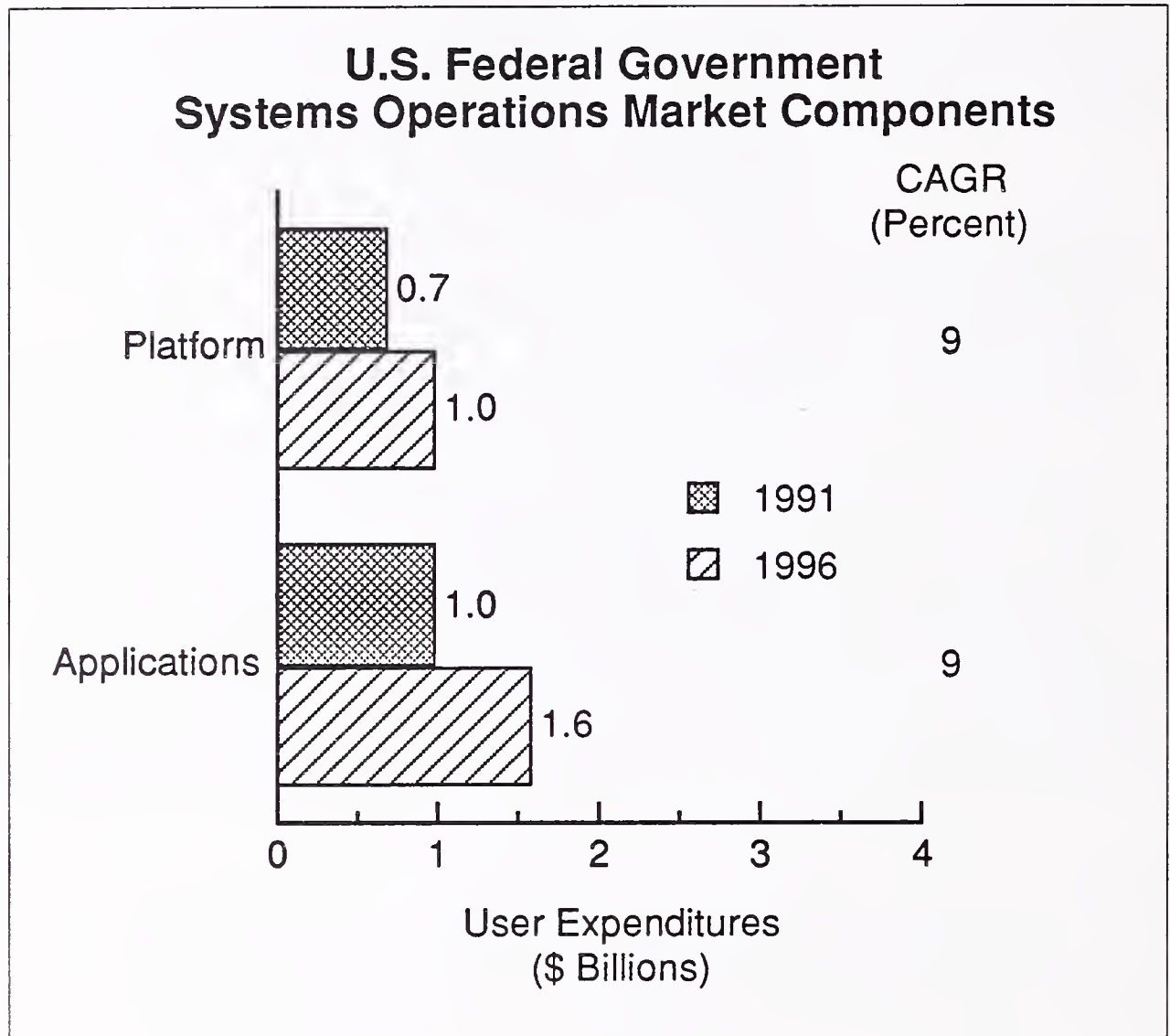


Exhibit IV-6 illustrates how the federal government continues to be heavily weighted toward applications systems operations. A higher proportion of federal government systems operations contracts involve both processing and software than in many other industry markets. This tendency is expected to continue, though there is no apparent acceleration in the change in the two components in the next few years.

EXHIBIT IV-6



The major systems operations vendors are all represented in the federal market because the contract award values are very large. EDS, IBM, DEC and PRC have existing major contracts. Andersen Consulting, AMS, and SHL Systemhouse are trying to enter the market through their professional services credentials. SAIC, Martin Marietta and Boeing Computer Services have the majority of their SO contracts with federal agencies, and all are expected to continue to focus on that segment. CSC was in the same category until its recent General Dynamics contract.

Alliances are becoming more common for major systems operations bids because of the complexity of the requirements. This trend to form alliances has set the pattern in the federal sector, and it will probably become common in the commercial sector also.

C

State and Local Government

This sector includes city, county, regional/district, and state government bodies, particularly those involved with public safety, highways, welfare, education, health and social services, and sanitation.

1. Industry Forces

Much like the federal government, state and local governments have come under greater financial pressures as requirements for services increase without corresponding improvements in the tax base. Passage of the Gramm-Rudman-Hollings Deficit Control Act had an immediate and continuing impact on federal support of state governments.

If past contracting patterns continue, 45% of state and local government expenditures will come from state governments, 30% from cities, 14% from counties, and only 11% from districts and other authorities. Proposals to expand data processing activities have been blocked by staff obsolescence problems and demand growth that continues to exceed available in-house resource capacity. Use of vendors to provide systems operations services is seen as more economical and politically more desirable, since it avoids increasing government employment levels.

2. Impact on Information Systems and Services

The mission of information systems departments in state and local governments has broadened considerably in recent years. Despite budget limitations, the demand for new services, especially on-line systems, has increased for health and social services, tax and fee collection for licenses, court and criminal justice needs, real estate construction/inspection/assessment data, voter/vehicle and business registration, and public safety and civil aid services.

Most older government information systems that operated in the batch processing mode have been replaced by interactive on-line service systems. Replacement or upgrade of hardware and software to meet new requirements has been met by standalone workstations, PC-based or turnkey systems, or by external vendors. The variety of solutions has not been amenable to shared data bases.

Connectivity between systems has been resolved at state and large metropolitan centers by reliance on commercial networks from the common carriers. Larger states, such as New York, Michigan, and Illinois, have implemented integrated (statewide) networks, some of them operated by vendors. Network implementation between office information systems and the larger data processing systems is still lacking in the medium-sized facilities of counties and districts.

However, cutbacks in staff and the inability of government agencies to remain competitive with private industry in salaries for technical personnel have resulted in a shortfall of qualified in-house staff. This shortage creates a natural opportunity for SO vendors.

3. Systems Operations Potential

The shortage of qualified project managers and technology specialists on in-house staffs will substantially increase SO prospects in this market segment. Agency executives and governing bodies want systems that can share data, provide planning services and information on public issues, assure the integrity and security of personnel data, reduce current maintenance backlogs, and offer more timely budget and financial data. Regional and district officials desire software tools that support analyses of alternative solutions to public sector problems.

Though federal budget cuts discussed earlier will have major effects on state IS budgets, the pent-up demand for new services and the relative obsolescence of the existing services in many states will force the agencies to devote their limited IS resources to new systems. The SO vendor that has experience in a particular delivery system, be it welfare payments, motor vehicle registration or health insurance, will look particularly attractive to states and counties faced with the need to rapidly upgrade their own operations.

Unfortunately, this market is large (82,000 government units) and geographically dispersed, presenting a significant problem for marketing and sales activities. The wide separation of opportunities also appears to foster greater dependence on local vendors that may lack adequate support staffs.

Despite the urgency of the need, many vendors find it difficult to compete because the roles and influence of officials, IS management, and advisory groups are not always clear, and some decisions seem arbitrary or politically motivated.

These negative factors are only aggravated by the current reduction in the federal budget which, in turn, impacts significantly the block grants passed on to the states. Exhibit IV-7 illustrates both the positive and negative factors at play in this market segment.

EXHIBIT IV-7

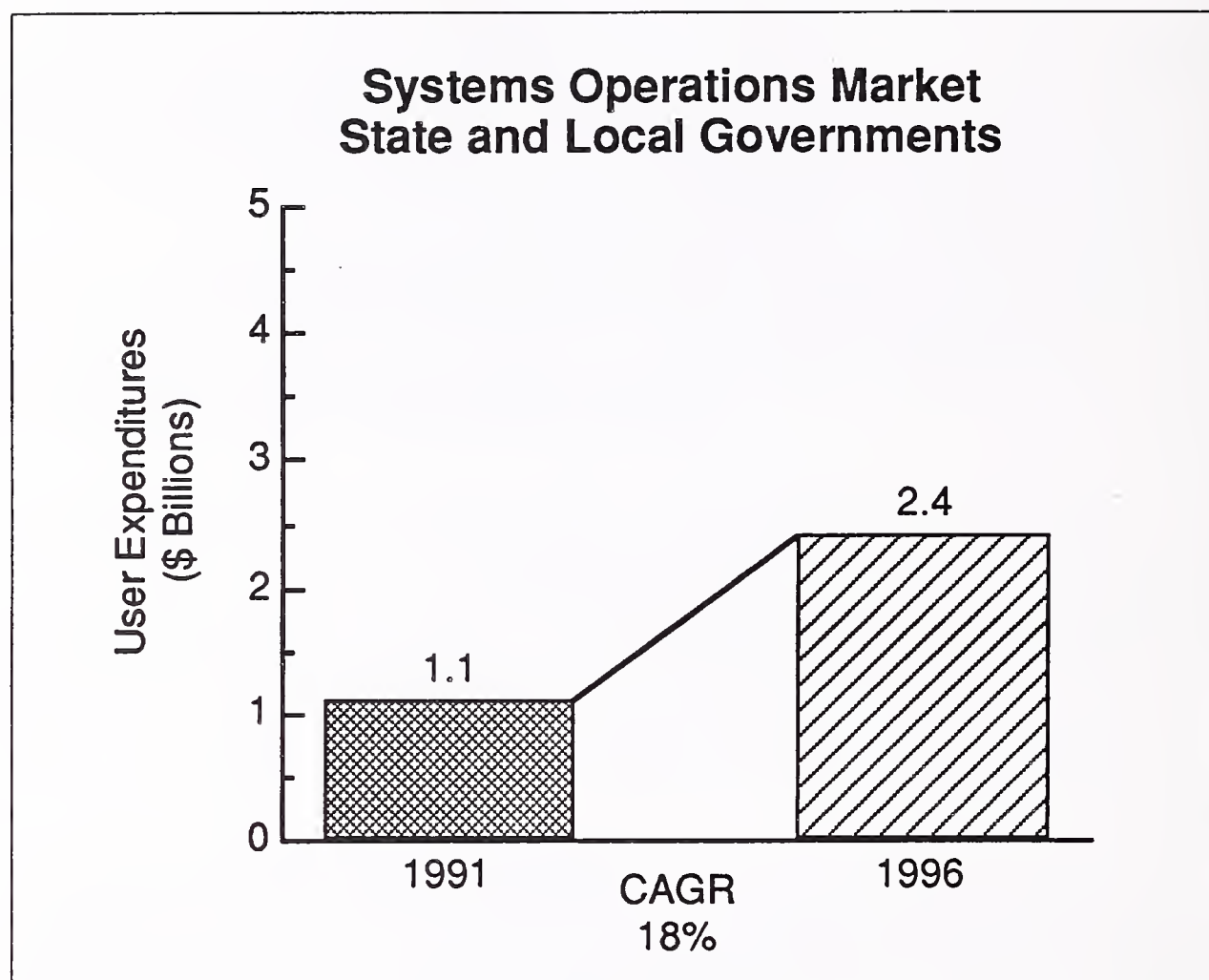
Key Factors in State and Local Government Market

- Positive
 - Increasing network and resource-sharing demands
 - Shortage of qualified in-house staff
 - New program and service demands
- Negative
 - Dispersed market (82,000 government units)
 - Emphasis on local vendors
 - Federal budget reduction impact
 - Federal revenue sharing ended

4. Systems Operations Forecast

Exhibit IV-8 shows that the growth rate for the state and local government sector will be 18% overall for the period 1991-1996. The uncertain future of funding through state and local taxes may limit growth over the period. The need for outside expertise and more efficient processing that SO vendors can supply does exist, but the decision makers are dispersed into relatively small units.

EXHIBIT IV-8



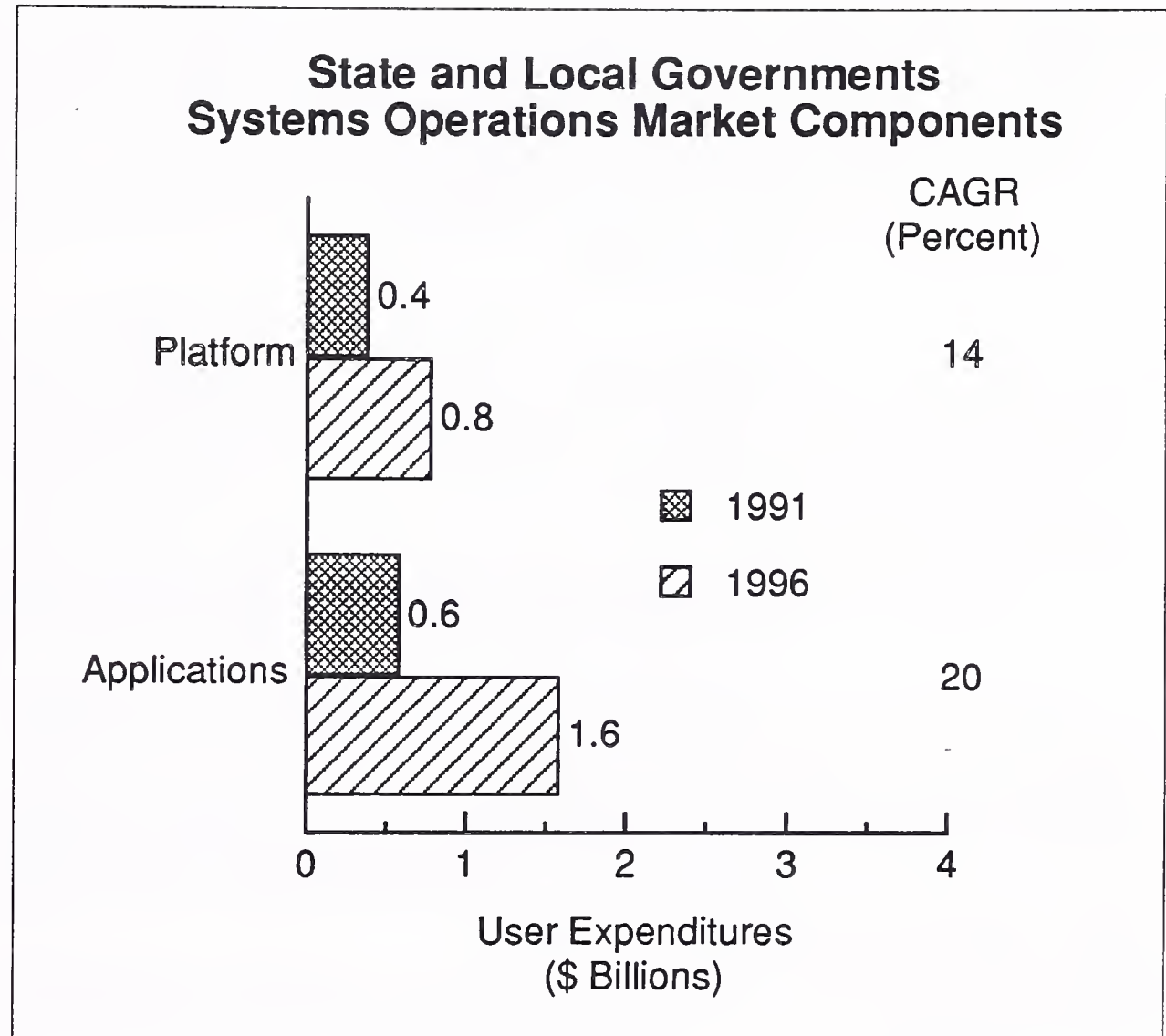
There will be a marked trend toward more applications systems operations over the 1991-1996 period, as seen in Exhibit IV-9. The platform systems operations vendors in this industry will begin assuming responsibility for software as clients find it more difficult to recruit staff with technical skills and clients begin to appreciate that they can all share common software from state to state in a number of applications areas.

EDS, SHL Systemhouse, and SCT have traditionally been successful in this marketplace and should continue to be. Andersen Consulting is parlaying systems integration work into longer-term systems operations contracts.

D**Health Services Industry**

This sector includes physicians, dentists, hospitals, medical and dental laboratories, nursing homes, outpatient care facilities, and allied services. It excludes health insurance and medical claims processing, covered in the insurance industry sector.

EXHIBIT IV-9

**1. Industry Forces**

Health care expenditures continued to rise in 1990, along with public concern on how to control the nation's growing health care costs. Competition is already a factor with the emergence of health maintenance organizations (HMOs), preferred provider organizations (PPOs), and investor-owned hospitals and group practices.

Hospital care is still the dominant category of costs even in an environment where occupancy rates continue to fall. To contain costs, the length of hospital stays has been shortened by shifting to outpatient care and home health agencies (HHA).

The federal government, Blue Cross/Blue Shield and other insurance companies, and even large employers are pressuring health care providers (physicians/dentists, hospitals, laboratories, nursing homes, outpatient care facilities) to reduce costs which continue to rise faster than the consumer price index (CPI).

The one-year increase in health services expenditures from 1989 to 1990 was over 10%, far outstripping inflation. Total health care spending, that approaches two-thirds of a trillion dollars today, represents 12% of U.S. gross national product (GNP). According to the government's Health Care Financing Administration, this could rise to a full trillion dollars, or over 13% of the GNP, as soon as 1995, and \$1.5 trillion (15% of GNP) by the year 2000.

Coupled with escalating costs is a decline in the number of people with health insurance. There are an estimated 37 million people without health insurance. An additional 21 million are underinsured. Some form of service is necessary for these individuals should they become ill.

With the continuing cost escalation, the federal government has taken an increasingly active role in identifying alternatives to control costs of providing health care. The government has established prospective payment systems (PPSs) in diagnostic-related groups (DRGs) and shifted reimbursements from a cost basis to a DRG basis.

With the escalating costs, declining number of people with insurance, and emergence of diseases such as AIDS that take an increasing toll on health care facilities, providers are forced to seek ways to provide more services at lower unit costs.

2. Impact on Information Systems and Services

Attention to the need for and cost of providing health care creates significant pressure on information systems professionals. There are a number of trends and issues of particular importance.

One recent trend is finding new applications for systems to serve physicians' and nurses' clinical needs—especially care planning, treatment administration, and record keeping—in ways that boost efficiency and cut costs. Cost-cutting measures are a particular need in nursing, where costs can vary substantially when overtime is required.

On the revenue side, documenting care is a closely related pressure, as Medicare now requires care to be documented to be reimbursable. Private payers now review and challenge charges regularly. New systems must play a role in addressing this need. Similarly, as electronic billing (through electronic data interchange) becomes more accepted, systems will be needed to link payment and patient care systems. IS departments will have to look to outside vendors for the expertise to install and operate these systems.

Documented care-based reimbursements demand current, on-line handling of patient information on a cost rather than an expenditure basis. Separate systems for financial operations, patient care, nursing management, and laboratory management are being combined to reduce data entry redundancy, error rates that accompany constant re-entry of the same information, and the wasted time that occurs with both.

3. Systems Operations Potential

The demand for new services support in hospitals comes at a time when IS departments are experiencing budget cuts or facing downsizing pressures. The in-house equipment is often obsolete, and no money is available for capital investment to upgrade that equipment. Lacking internal resources to develop systems, hospitals and other medical organizations are looking to applications systems operations vendors that provide packaged applications software as part of their service.

Medical institutions that have recently entered into systems operations agreements stressed their requirement that the proposed solution contribute immediately to cost savings. Systems operations vendors will need to provide creative financing and a strong case for the cost savings that will result from outsourced operations.

On the negative side, a number of factors are also at work. These are also outlined in Exhibit IV-10.

Hospital management is generally reluctant to deal with any new vendors. They prefer to deal with vendors who have demonstrated industry experience and success, either in the processing or the applications area. Given the tight financial constraints imposed on hospital management because of escalating costs, the systems operations vendor will have a difficult time convincing systems buyers, unless he knows the industry well.

Hospital management companies such as Sentara, Hospital Corporation of America, and Humana are becoming significant players in the industry, as they continue to take over the management of private hospitals. They have large information systems operations that are very in-house oriented, so even this growing segment of the industry will be hard to penetrate.

Finally, the continued downsizing of many private hospital information processing departments, from mainframes to mini- and microcomputers, is reducing the potential market for systems operations. When a hospital has no mainframe processing to outsource, there is little potential for a systems operations vendor.

EXHIBIT IV-10

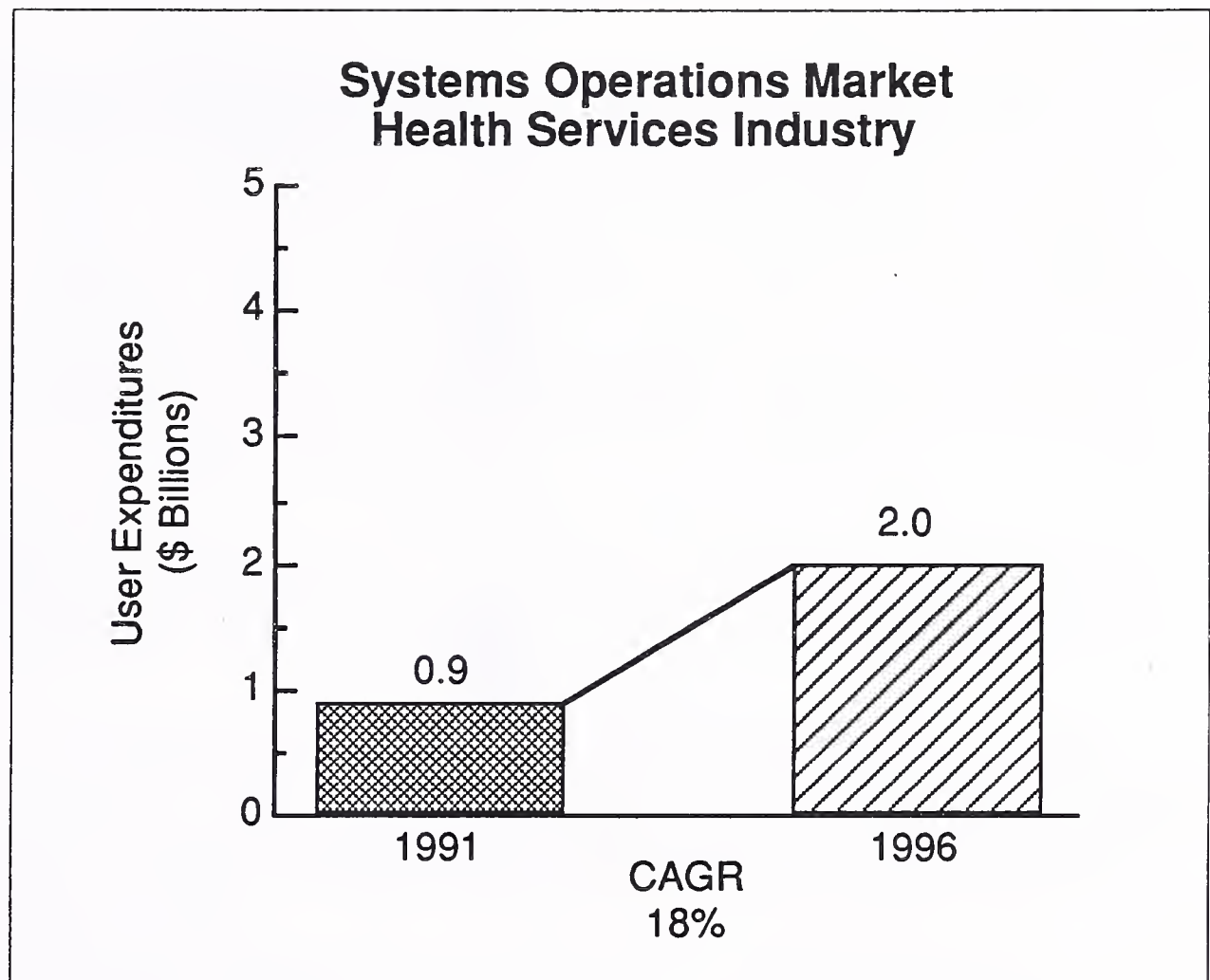
Key Factors in Health Services Industry

- Positive
 - Pressure to contain medical service costs
 - Growth in departmental systems
 - Large number of medium-sized hospitals
 - Increasing outpatient services
 - Need for new services
- Negative
 - Need for industry knowledge
 - Limited in-house staff experience
 - Bottom-line financial limitations
 - Hospital management companies in-house oriented
 - Downsizing of internal hardware

4. Systems Operations Forecast

In spite of the negative factors mentioned above, the market for systems operations in the health services vertical industry market is expected to grow at the rate of 18% in the period from 1991 to 1996, as seen in Exhibit IV-11.

EXHIBIT IV-11

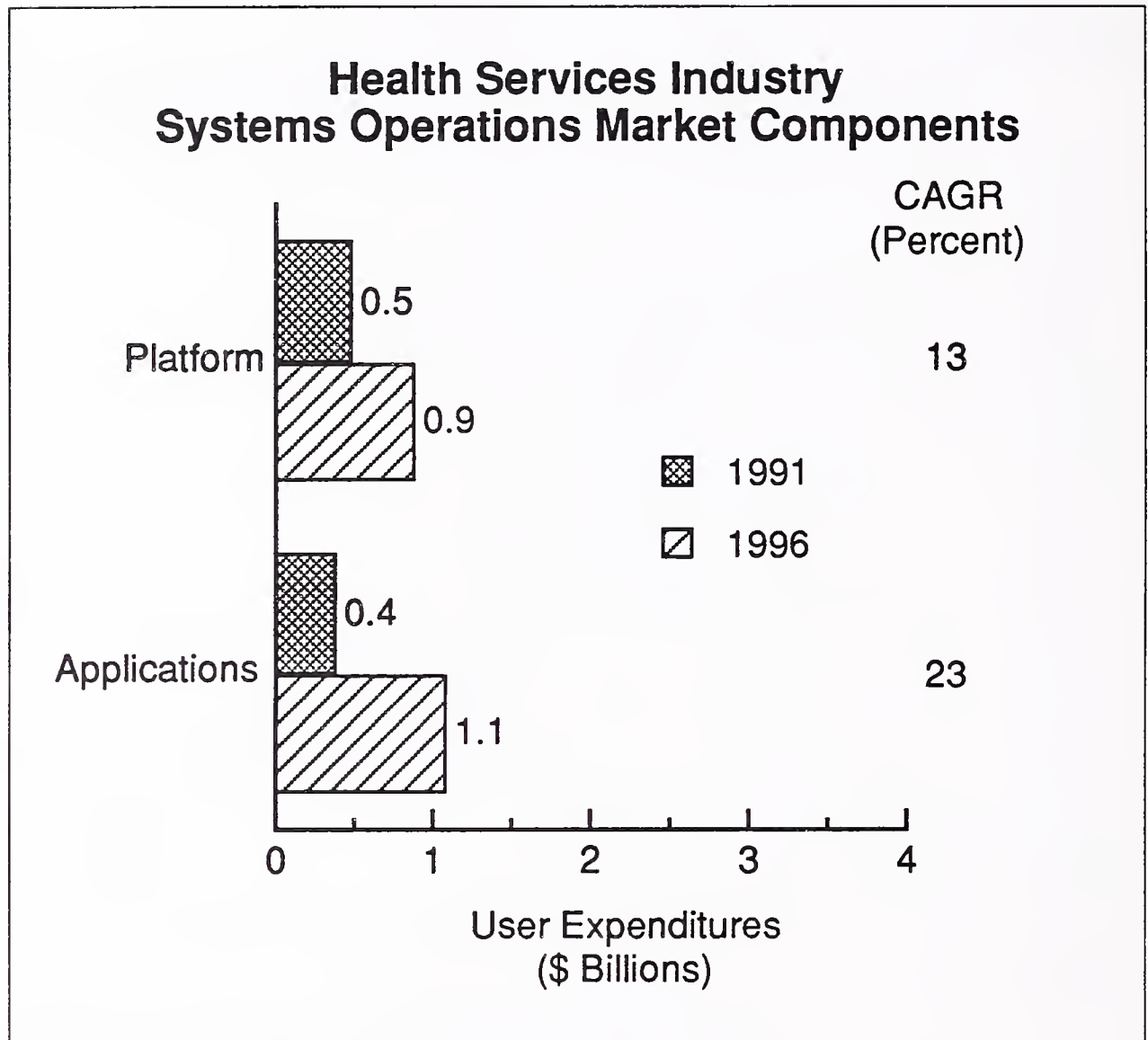


This projected growth rate is slightly higher than that in INPUT's last report (17%). The continuing pressure to reduce costs, and the need to track patient-related data even more extensively, have stimulated the growth. A countertrend to downsize operations has left many internal information processing organizations with only micros or minis to manage.

Exhibit IV-12 shows that applications processing operations represent 44% of the current base in the health services industry. This trend will accelerate until application operations represent 55% of the mix over the five-year period. Systems operations vendors will continue to provide both processing and applications expertise to the prospects who, in turn, feel increasing pressure to downsize their staffs and rely on vendors for all of their outsourcing needs.

Prominent systems operations vendors in this industry are Shared Medical Systems, Cycare, and American Express Medical Systems. All are specialists in health care processing. In addition, EDS and Perot Systems obtained large contracts for systems operations from hospital management companies in 1990. Yet the two largest hospital management companies, HCA and Humana, themselves do processing for noncaptive hospitals, and therefore, must be considered systems operations vendors. In these cases, the hospitals usually have had an earlier affiliation with HCA or Humana.

EXHIBIT IV-12

**E****Discrete Manufacturing Industry**

The discrete manufacturing sector includes a wide variety of fabrication or assembly-type activities. Discrete manufacturing is a disparate collection of narrowly focused vertical markets, each with its own specific characteristics. Care must be taken not to view the sector forecasts as referring to a homogeneous market.

Analysts combine specific products into major industry groups, such as: aerospace, automotive, metal fabrication, electrical, electronic, telecommunications, textiles, industrial machinery and tools, to simplify discussions of trends.

The forecast for this sector excludes unique automation devices such as robotics and other non-information machinery.

1. Industry Forces

The U.S manufacturing industry continues to be impacted by numerous factors including foreign competition and an overall weak economy. As a whole, the manufacturing industry recognizes the need to invest in new plants, facilities and technologies that will permit more cost-effective operations. Only with significant levels of investment will the industry be competitive against more modern, foreign producers. Investment ability is limited, however, by weak financial structures and an increasingly limited availability of capital. Foreign competitors' successes in penetrating the U.S. domestic markets also continue to discourage growth in this sector.

As a result of a weak economy and growing foreign competition, the manufacturing industry has grown slowly. Many companies have not grown at all, as evidenced by the number of consolidations and business failures.

The Department of Commerce's 1990 *U.S. Industrial Outlook* report projected that 80% of manufacturing companies would experience positive growth rates. However, of this total, 72% would be no greater than 5%. Only an estimated 9% of companies would grow at a rate of 5%-10% during the year.

The Department's 1991 report indicates the situation has not improved; if anything, the situation has deteriorated. In its most recent report, 60% are expected to show positive growth rates and only 9% are expected to exceed a 5% growth rate.

Difficulties in the discrete manufacturing sector, as a whole, are an indicator of both the opportunity for information services to improve business operations and the difficulty systems operations vendors have in marketing to the sector.

In INPUT's report, *Systems Integration Technology Directions*, respondents were very clear in their focus on the core business. Respondents were clearly less interested in technology than in solutions that would improve their basic operation processes.

Manufacturers are implementing flexible manufacturing systems (FMS) to improve the ROI of capital machinery, and providing rapid reconfiguration to meet changing fabrication/assembly demands.

Manufacturing planning and control systems (MPCS) and material resource planning (MRPII) are being employed, along with practices like just-in-time to reduce the costs of carrying inventory. Automation of the shop floor and the efficient utilization of inventory and capacity are viewed as the main productivity goals of the industry.

INPUT believes that the application of these technologies can contribute to cost control. Real advances in productivity will come, however, only by revising the entire manufacturing process, rather than by piecemeal automation that produces islands of automation with relatively small improvements.

Production experts have postulated the urgency of the need to implement existing technologies, as well as those now in development, for the survival of the majority of discrete manufacturers in the 1990s.

The current recessionary forces and lack of real growth of capital investment will delay some of the capital investment decisions needed to implement these technologies, and further aggravate the cost pressures in less modern manufacturing sectors.

2. Impact on Information Systems and Services

The IS environment in discrete manufacturing seems stable, perhaps even mature. Decreasing hardware costs, better price/performance ratios, and emphasis on purchasing rather than leasing equipment have all served to create a very large base of installed systems, including hardware and software.

The push to automate manufacturing processes has also created a very large base of mostly incompatible and unconnected process control and automation equipment, ranging from materials handling, CAD/CAE, and process controllers to assembly robots and automated guidance vehicles for parts retrieval from stores.

In many discrete manufacturing firms, the IS and production organizations function independently of each other, seldom sharing the same data processing platforms. Information systems that process the financial, sales and administrative aspects usually come under the control of the IS organization. CAD/CAE/CAM/CIM systems tend to be the responsibility of the production/operation departments, often not involving the IS department. However, the newer MRPII and MPCS systems merge the separate functions, requiring interaction and agreement between the two groups.

The new systems that integrate the sales, purchasing, invoicing, production, and inventory control functions will push IS into interactive, on-line, and real-time or near real-time modes of operation. A substantial number of current financial and administrative systems in this industry do not and have not needed to operate in real time, and are not equipped with hardware and software to support the needs of flexible manufacturing systems (FMSs).

3. Systems Operations Potential

Exhibit IV-13 summarizes the key industry factors at work in this vertical market.

EXHIBIT IV-13

Key Factors in Discrete Manufacturing Industry

- Positive
 - Increasing pressure on manufacturing quality
 - Preference for customized solutions
 - Continued replacement of batch-oriented systems
- Negative
 - In-place infrastructures
 - Tendency to build rather than buy
 - Industry experience prerequisite

The size of this sector and the potentially large expenditures are attractive to SO vendors. The use of outside services is growing faster than inside services, because management is becoming focused on its core business requirements, which do not include data processing operations.

The current inventory of batch-oriented systems must be replaced to meet the needs of integrating sales-to-customer factory procedures. Some of the newer hardware may be convertible, but the major share needs to be replaced. Increasing use of PCs and workstations for sales, design, scheduling and supply/resource control will make the conversion even more important, while encouraging the use of distributed networks in a difficult environment.

Vendors should be sensitive to the presence of IBM in determining a suitable platform strategy. IBM has short-term products in place (CAD/CAE, industrial robots, shop floor microcomputers, etc.) and an apparent long-term strategy of tying these components together in an architecture based on a mainframe.

Since IS managers frequently cite the absence of project management skills in their staffs, SO vendors can capitalize on that resource in their own staffs when meeting prospects. Executives note the increasing use of systems specialists for CAD/CAE/CAM and automation projects built in-house as workload and financial conditions permit. The tendency of the larger organizations is to build their own systems rather than buy them from a vendor.

Two notable exceptions to the above rule are General Motors and Kodak. The former acquired outside professional management for its IS operations by buying EDS. Currently, 53% of EDS' revenue is generated by services provided to its parent, GM. The partnership has been beneficial for both parties. GM has been able to apply EDS' experience in systems management to its own operations problems, while EDS has obtained a cadre of manufacturing specialists in the process. In the case of Kodak, the decision was to leave the information systems activities to experts—in this case IBM for systems operations and Digital for network operations—and concentrate on Kodak's success at developing and marketing photographic products.

Medium-sized and small companies are usually less inclined to carry the needed specialists in their constrained overhead accounts. They need to implement and operate manufacturing support systems as much as the large companies to remain competitive while maintaining quality. They present good opportunities for SO vendors who can demonstrate that expertise.

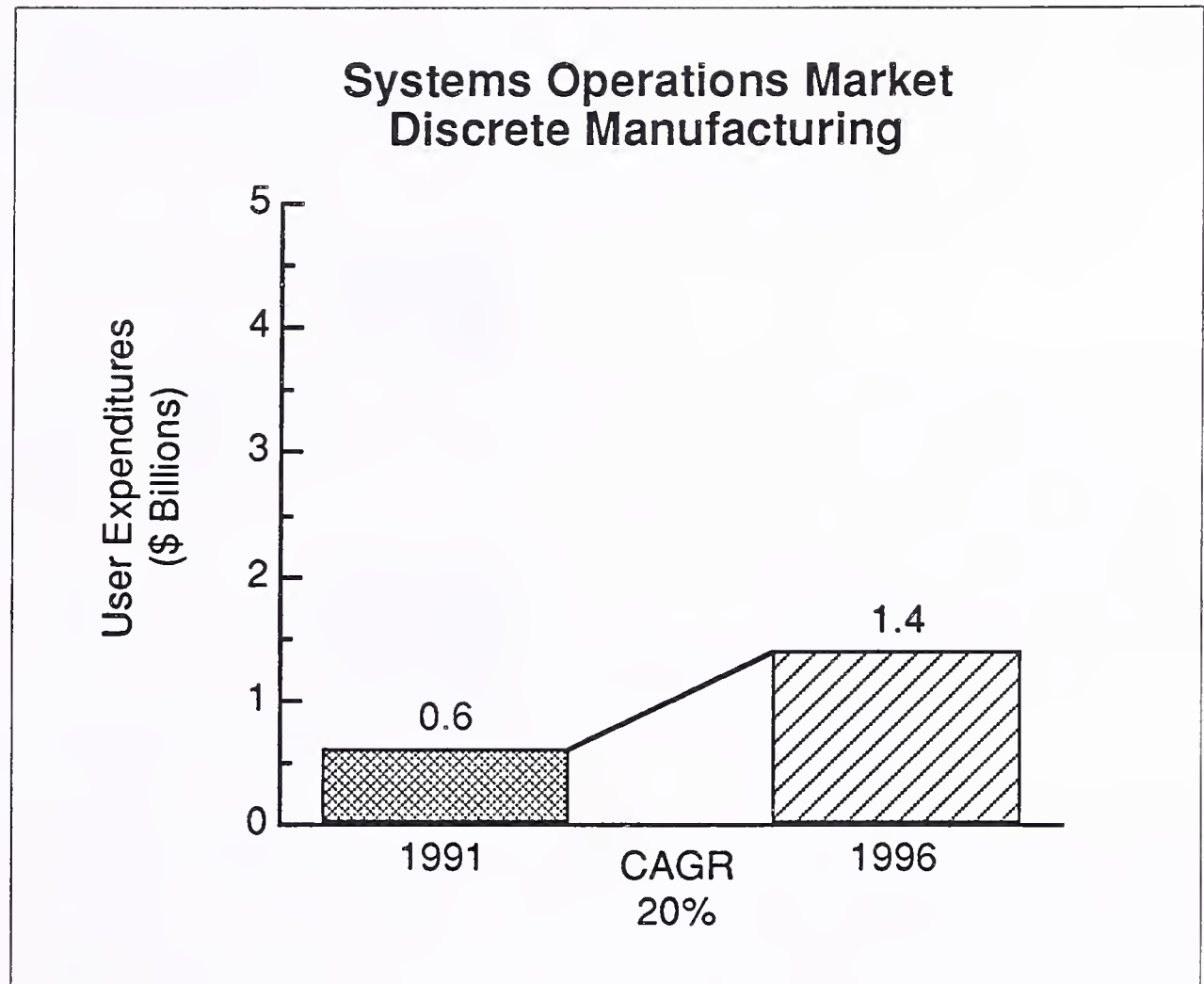
Other companies, under pressure to remain competitive, choose to reduce their operations or enter into a merger to accomplish that downsizing. These transition situations are ideal opportunities for SO vendors also, particularly for those willing to assume ownership of hardware and assimilate the operations staff of the IS department.

4. Systems Operations Forecast

The forecast for this sector is illustrated in Exhibit IV-14. It shows a healthy overall growth rate of 20% for the 1991-1996 period.

This represents a decrease in the growth rate from 1990 (down from 22%). Though manufacturing executives now understand that information services is not their primary business, the loss-of-control issue is not yet resolved in their minds in spite of the examples at Kodak and American Standard.

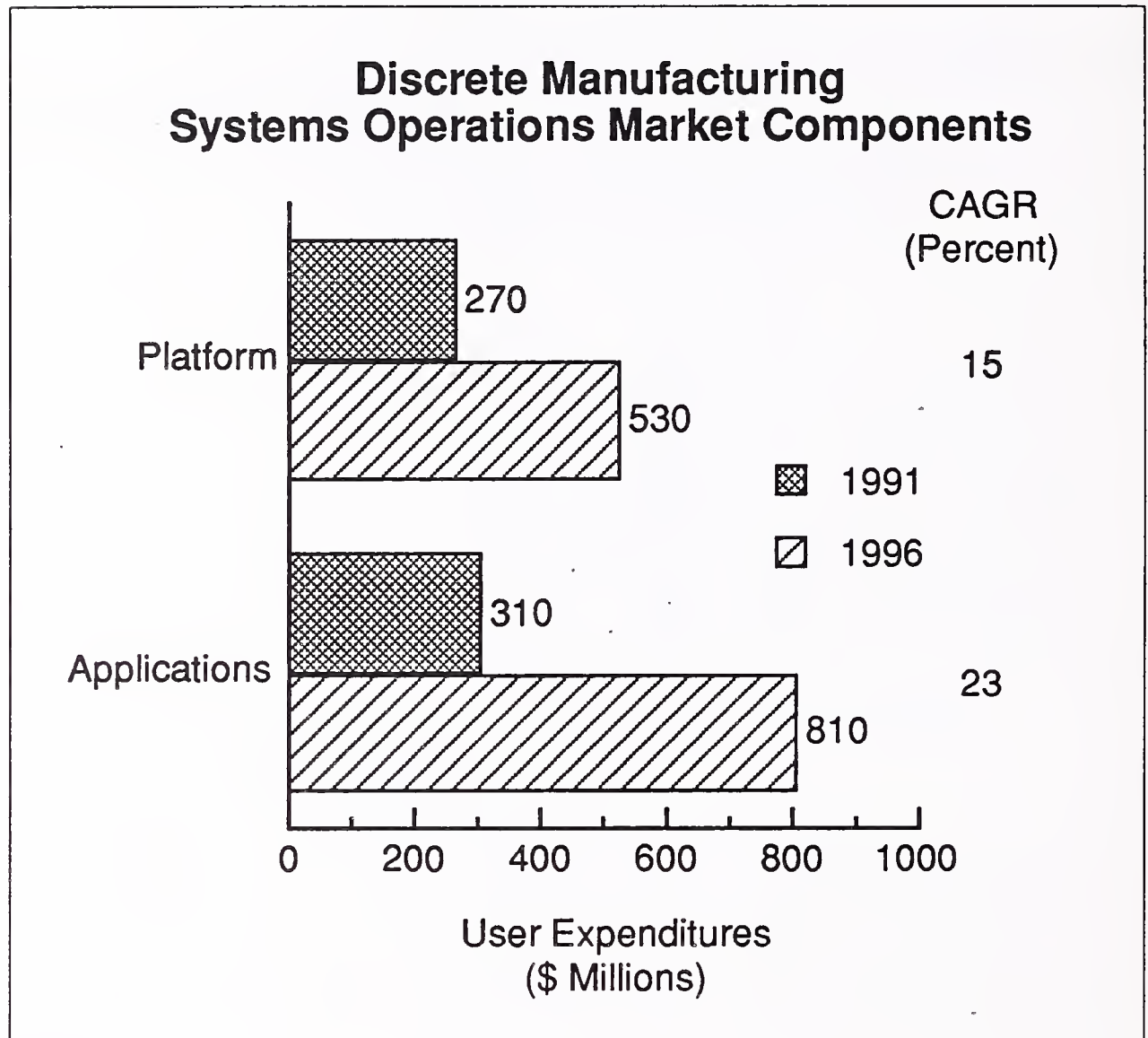
EXHIBIT IV-14



Applications processing will continue to be a major mode in the discrete manufacturing industry for 1991-1996. However, by 1996, applications processing will become a still larger component of the total SO expenditures, as shown in Exhibit IV-15.

The different requirements of the market are being addressed by several groups of vendors. Equipment vendors competing in this market include IBM and DEC, leveraging their strong, early presence in this market. In addition to Andersen Consulting, other leading industry specialists are Genix Group and Power Computing. EDS holds a unique position combining three ingredients that are very attractive to industry executives. EDS brings extensive communications experience from its internal network; it has been in the facilities-management business for 28 years; and it has acquired extensive manufacturing experience in support of GM's internal needs.

EXHIBIT IV-15



An interesting entry in this market is Information Systems Incorporated (ISI), which converts smaller manufacturing companies to MSA's manufacturing software. Actual operations support is provided through ISI at a Litton data center.

F

Process Manufacturing Industry

This sector is a combination of medium and large corporations active in oil and gas, mining, tobacco, chemicals, paper and wood products, food processing, rubber, primary metals, and plastics manufacturing.

1. Industry Forces

In general, this industry sector has seen an increase in competition brought on by decreased demand from a slowing economy. Wood products are suffering because of the stagnant domestic construction market. Lower prices and margins for ethylene and plastics are resulting in increased

competition for the chemicals and plastics industries. The food processing industry faces a recent trend in reduced consumer spending that may result in a shift of consumer preference to lower-margin generic brands. The oil industry, on the other hand, has been marked by higher earnings, greater cash flow, and increased merger activity. However, the oil industry continues to face both near- and long-term uncertainty because of the uncertain Middle East situation.

The process manufacturing sector has been driven in recent years more by the economy and off-shore competition than by manufacturing technologies. Major efforts are focused on reducing costs, improving operating efficiencies, increasing capacity utilization, and reducing capital commitment risks, while maintaining a competitive posture through automation. The solution to the cost problems of some organizations was mergers to gain economies of scale. Further mergers may be in the offing in response to the recession that is impacting manufacturing industry revenues.

2. Information Systems and Services Environment

This diversified market sector was buffeted by different economic winds this past year. Mergers and consolidations in the oil and gas sector created problems of excess capacity, redundant IS staff in some cases, and incompatible processing platforms, an ideal environment for the outsourcing of systems operations. Competitive pressure in the chemicals, food processing and rubber and plastics industries focused attention on cost-reduction programs.

Automation of manufacturing processes, as in discrete manufacturing, was a key initiative. Unlike discrete manufacturers, however, process manufacturers also had extensive needs for communications networks that tie the sources of raw material to the processor and the processor to the seller.

Much of the attention of information systems organizations in these industries is directed at process control, inventory control and manufacturing control systems. These systems are traditionally the domain of the minicomputer vendors and the specialty instrumentation suppliers. They are less amenable to processing on general-purpose machines. All of these systems, however, do generate data streams for general business procedures such as scheduling, purchasing, and inventory control.

3. Systems Operations Potential

Like discrete manufacturing, this industry needs to meet widely varying competitive market demands. It needs to unify and coordinate diverse data structures, process systems, and application developments to support marketing and strategic management. Network communications management skills are in high demand to extend these activities to multiplant operations.

IS managers can identify shortcomings of in-house project management and network design skills, and are becoming less reluctant to pay a vendor for these capabilities. Interestingly, training and transition management are also highly valued in projects, but internal staffs appear to be inadequately prepared to provide them.

In this market, support for marketing and strategic planning requires more sophisticated tools that are well-suited to computer use and that will add to a vendor's credibility. Each industry, and even specific companies, employ processes that will need customized solutions from vendors with industry knowledge. Exhibit IV-16 presents some key factors influencing buying decisions in this sector.

EXHIBIT IV-16

Key Factors in Process Manufacturing Industry

- Positive

- Competitive need to meet market demands
- Need to improve operating efficiencies
- Network design/management requirements
- Slow economic recovery

- Negative

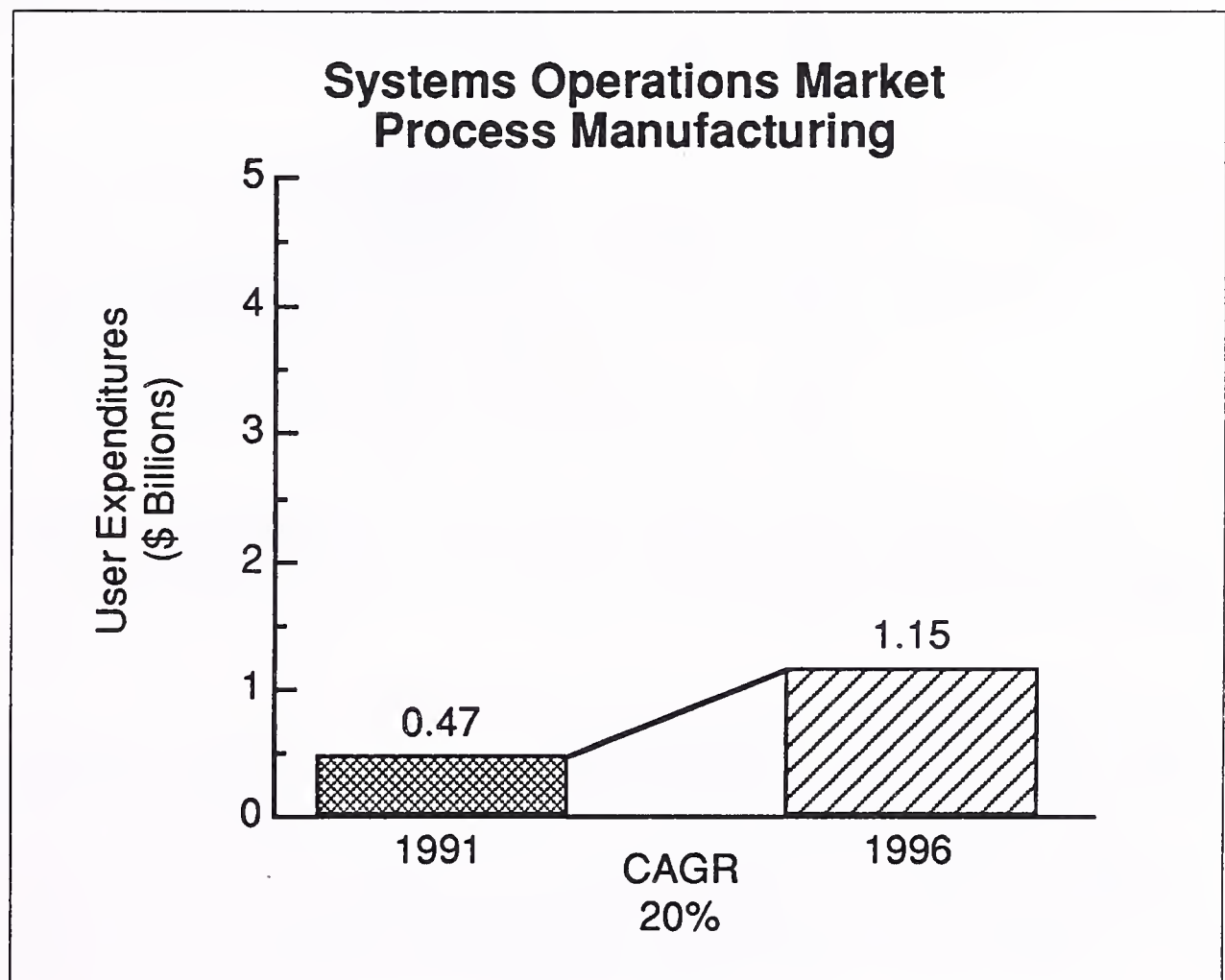
- Diverse client needs according to industry segment
- Processing concentrated in operations
- Reluctance to consider outside help

The stagnant economy augurs lower profits. Management is promoting tactics that preserve capital, even though the oil industry may experience short-term profits from the increase in oil prices caused by the Middle East crisis. In this industry, the projects are concentrated on the production side, which must be the focus of the potential systems operations vendor.

4. Systems Operations Forecast

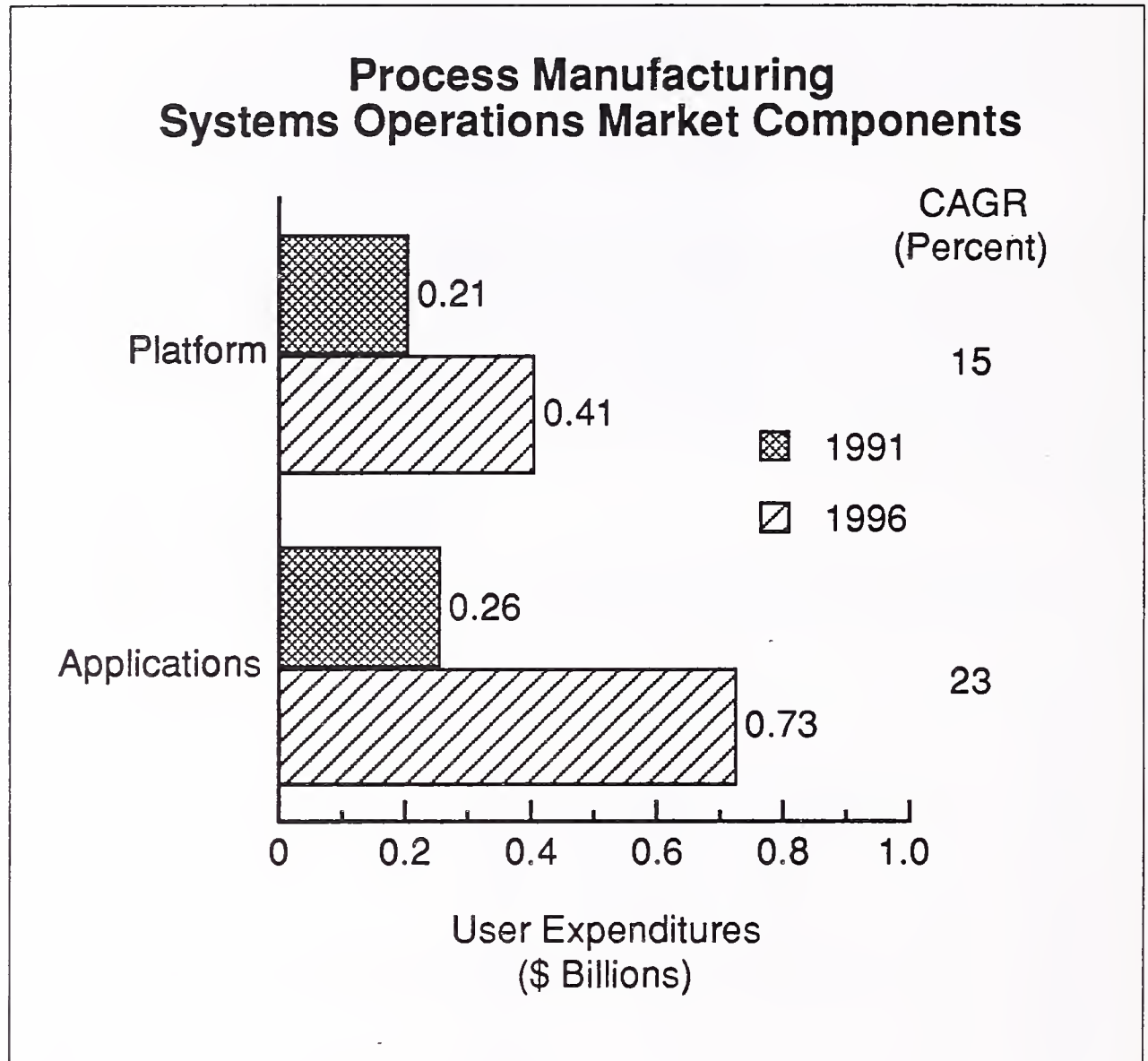
INPUT projects a 20% CAGR for this industry for the period 1991 to 1996, which is up significantly from its projection of 16% last year (see Exhibit IV-17). There was a sharp increase in expenditures, as predicted, spurred by a series of consolidations and mergers in the troubled oil and gas sector. The negative factors in the market (i.e., diverse client needs and concentration of operations-oriented systems on minicomputers) will not cause the growth rate to level off, but will keep this industry sector growing better than the entire systems operations marketplace.

EXHIBIT IV-17



The gap between platform and applications processing operations will widen in the period 1991-1996, as shown in Exhibit IV-18. In 1991, 44% of the expenditures are for platform operations, while in 1996 only 36% will be platform operations expenditures. Though much of the revenue in 1990 was generated by platform operations, the shift will occur over the next five years because more clients and prospects will choose to outsource their applications developments as they feel more comfortable with having outsourced their processing operations. Clients in this vertical industry market are already reporting they are investigating this further step in their outsourcing agreements.

EXHIBIT IV-18



Vendors with a strong presence in the discrete manufacturing sector also appear as strong suppliers in this segment. Andersen Consulting is particularly strong in food processing, while EDS has been very successful in capitalizing on the consolidation in the oil and gas industry. Many companies in this sector have indicated that using a systems operations vendor provides greater flexibility in meeting changing IS requirements as business demands change. This motivation often was cited as more important than any immediate cost savings.

G

Transportation Industry

This sector is composed of airlines, railroads, trucking, and other transportation, including shipping, mass transit, postal, and pipeline services.

1. Industry Forces

This industry performed poorly in 1990 because of the downturn in the economy, environmental concerns, and increased oil prices. All of the transportation industry is feeling the pinch of the economic slowdown because it is closely linked to the general trends of the U.S. economy. However, there are some areas that are showing innovation and profitability.

Increased use of less-than-full-truckload shipments and double trailers helped trucking to increase revenues. Rate discounts have continued to cut margins in 1991. Restructuring and mergers are expected to continue to contribute to a decline in the industry's revenues and profits.

Air cargo and air express competitors have added automation, extended data communications, and bar code readers to their arsenal of competitive weapons. Intermodal shipping companies that combine rail, road, and water transportation are on the increase, with several employing sophisticated load-modeling tools to improve efficiency.

2. Impact on Information Systems and Services

Limited growth in IS expenditures is expected as transport firms try to control costs and remain competitive. Productivity and efficiency are paramount in reducing personnel costs. IS organizations have been kept small and productive.

Part of the strategy is replacement of personnel wherever possible with external vendors or less labor-intensive systems. Technology lowers the cost of overall service by reducing labor costs and, at the same time, improves the speed of response required to remain competitive. Systems are necessarily communications intensive. Travel reservation systems, crew and maintenance scheduling, and route and load optimization modeling are the current backbones of the industry.

The deregulation of this industry fostered a competitive environment that demands the use of automation technologies as competitive tools. Price wars based on more progressive tariff structures have cut so dramatically into revenue that many firms need to take additional cost-cutting measures. The industry has only a limited number of large transportation companies in the airline sector and in rail transport with the sophistication to accomplish the technological changes internally.

The competitive battleground is largely in the reservation systems required for securing, at a guaranteed price, space for the movement of people or cargo. Since prices seem to change daily with deregulation, and since the agents who need this up-to-date information are dispersed over vast areas, complex networking experience is the ticket to this industry. Some positive factors are in place for SO vendors to step in and service the market.

3. Systems Operations Potential

There are a limited number of opportunities because of the low level of anticipated expenditures outside the airlines segment. In the airline sector, opportunities will tend to involve communications-intensive solutions.

Systems operations vendors operating in this market sector will need to make changes to a complex system easily and without interrupting ongoing operations. Vendors need to offset the recognized technical weaknesses in the prospect's internal staff as well as their limited capabilities in project management. These and other negative factors are outlined in Exhibit IV-19.

EXHIBIT IV-19

Key Factors in Transportation Industry

- Positive
 - Network requirements
 - Systems seen as competitive tools
 - Limited capital investment availability
- Negative
 - Limited opportunities outside of airline segment
 - Limited growth in IS expenditures
 - Limited use of outside services

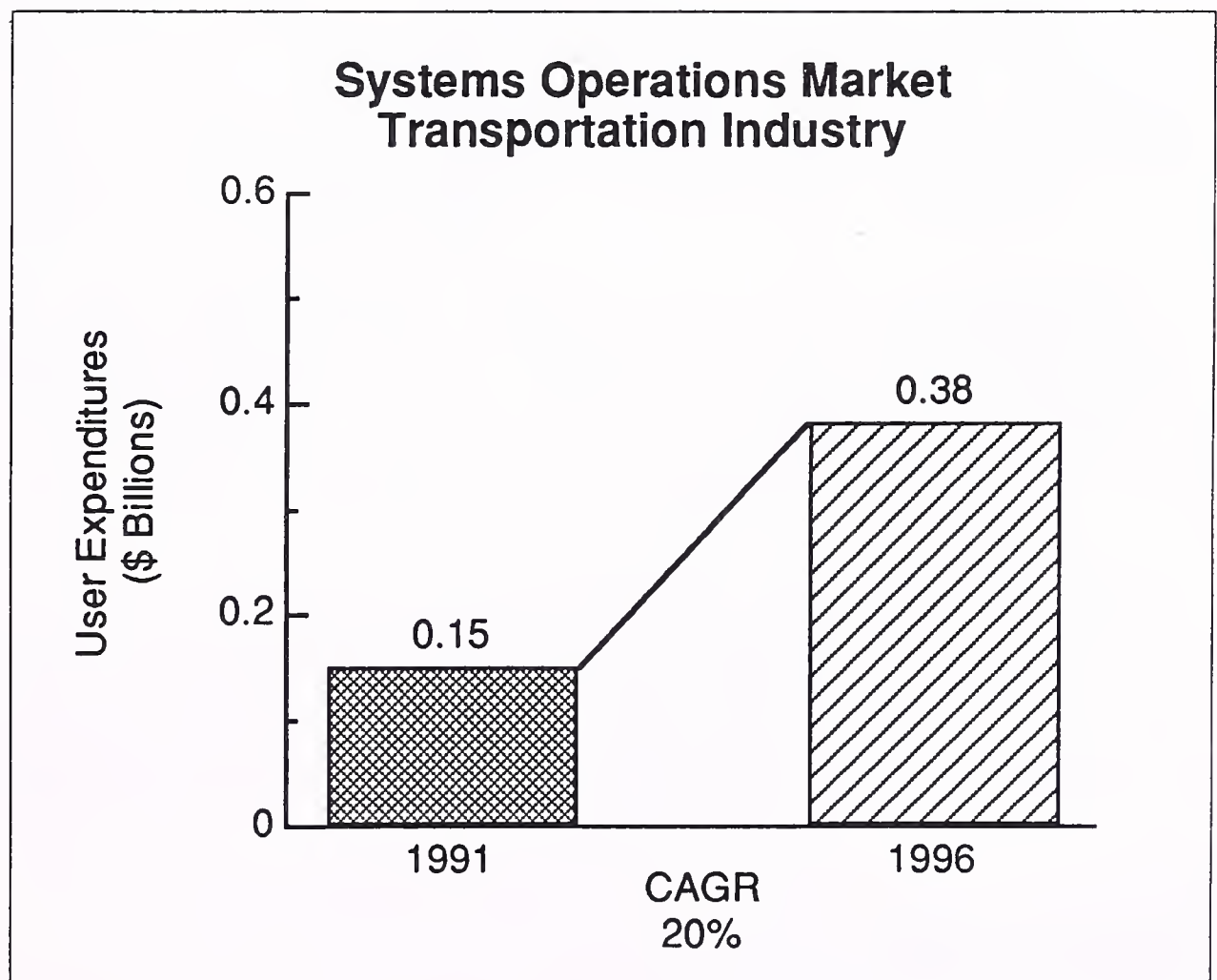
The rail industry has begun looking at some automation projects that have potential for systems operations outsourcing, but the trucking industry seems unable to support them. These segments are not particularly accustomed to the use of technology or the need to apply automation.

INPUT expects other portions of this market—rail, truck, and ocean transportation—to continue to be stagnant in spite of their urgent need to reduce costs. There appears to be a lack of sophistication in some of the sectors, which results in reluctance to outsource operations. In the rail transportation sector, respondents indicate that any outsourcing that will develop will be strictly for communications services or remote special data-gathering functions, not for complete information processing centers.

4. Systems Operations Forecast

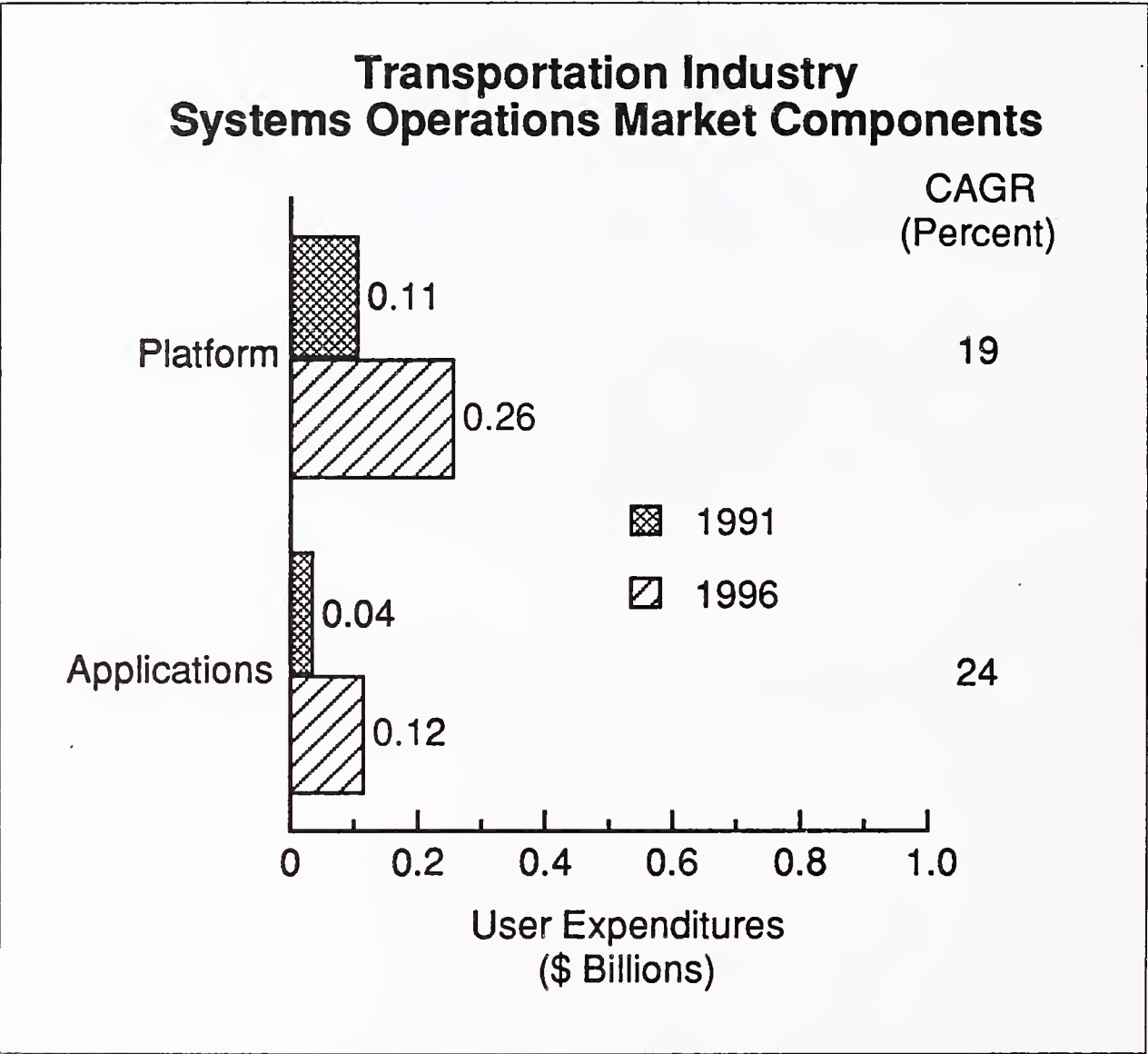
The projected CAGR for the period 1991 to 1996 for this market sector is 20%, up from the projected 16% reported in INPUT's last report. This forecasted increase represents activity primarily in the airlines sector. Exhibit IV-20 presents this data.

EXHIBIT IV-20



As indicated in Exhibit IV-21, the expenditure split between platform and applications processing is expected to change slowly over the five-year period. The large market share for platform operations reflects the continued activity in the airline sector, as opposed to new developments in other sectors.

EXHIBIT IV-21



EDS is the dominant vendor in this market. There is no reported activity among other major SO vendors in this sector, although Andersen Consulting has done some systems integration projects in the transportation market and may capitalize on these in the future.

H

Utilities Industry

This sector includes the energy market (electricity generation and coal/nuclear/hydro/oil/solar/geothermal/gas energy production), water utilities, and sewage/waste disposal and treatment, but excludes telecommunications.

1. Industry Forces

Although the Iraqi invasion of Kuwait sharply increased oil prices, the electric utilities industry has minimized the effects of the price increase by reducing its dependence on oil and shifting its production to other sources of fuel such as natural gas. Natural gas has the most to gain from the increase in oil prices, because environmental concern and oversupply have already made gas preferable and cheap. Nuclear power still faces environmental concerns along with high set-up costs. Coal burning also causes environmental concerns of air pollution.

Pressures continue on the utilities for mergers, improved cooperative load sharing and a search for funds for more facilities. The poor condition of utility balance sheets results from the enormous cash drain many utilities have suffered as a result of litigation, project overruns, environmental clean-up measures, and, in particular, nuclear power plant construction. This situation is unlikely to be resolved in the near future.

2. Impact on Information Systems and Services

IS has been forced to shift from a comfortable day-to-day operating orientation to one where IS must meet dynamic demands within constrained budgets. Management has directed IS to help enhance operating efficiency and productivity, to make the utility more profitable and reduce costs, while increasing the ability to serve users. Cost containment remains the principal focus of all operations support activities.

IS management's attention is turning to data communications requirements that will make systems available to users, even at remote locations. Many of the support systems are being changed from batch to on-line. Issues regarding the proper use of advanced technologies and distributed versus central processing are now being addressed in new systems.

Under the consumer-oriented constraints imposed by regulatory and environmental authorities, and the resultant low ROI, investments are limited and prevent implementation of a number of desirable improvements in data and control systems. Operating executives have modular, rather than total, views of the systems; their perspective is restricted to raw materials, processing, maintenance, or customer relations. Traditional views are slow to be modernized in this basic industry.

3. Systems Operations Potential

Exhibit IV-22 presents key factors affecting IS departments in the utilities industry.

EXHIBIT IV-22

Key Factors in Utilities Industry

- Positive
 - Increasing complexity of technology
 - Hardware/software obsolescence
 - Automation of repetitive tasks
- Negative
 - Day-to-day orientation of IS
 - Limited number of establishments
 - Financial Constraints
 - Incentive to add to in-house capacity

Information systems managers in the utilities vertical-industry market are faced with the increasing complexity of technology, whose introduction is a labor-saving measure. This technology includes remote meter readers, remote sensing hardware, other control equipment and devices to eliminate redundancy. Their own data processing shops and staffs, meanwhile, are becoming obsolete and cannot interface with the new technology. Systems operations vendors can leverage scarce technical expertise and help them out of their dilemma. Yet there are strong counteracting forces to these incentives.

The in-house orientation that is traditional in utilities firms continues, fostered by a conviction that cost containment policies are working. The fact that the firm's capital equipment base is used in calculating the rate base for most utilities encourages the accumulation of data processing hardware in-house. The net effect is to discourage the search for solutions outside the company, except in very specialized cases.

4. Systems Operations Forecast

The compound annual growth rate (CAGR) for this industry for the period from 1991 to 1996 is 14%. This is slightly lower than the 1990 forecast. See Exhibit IV-23 for a summary.

EXHIBIT IV-23

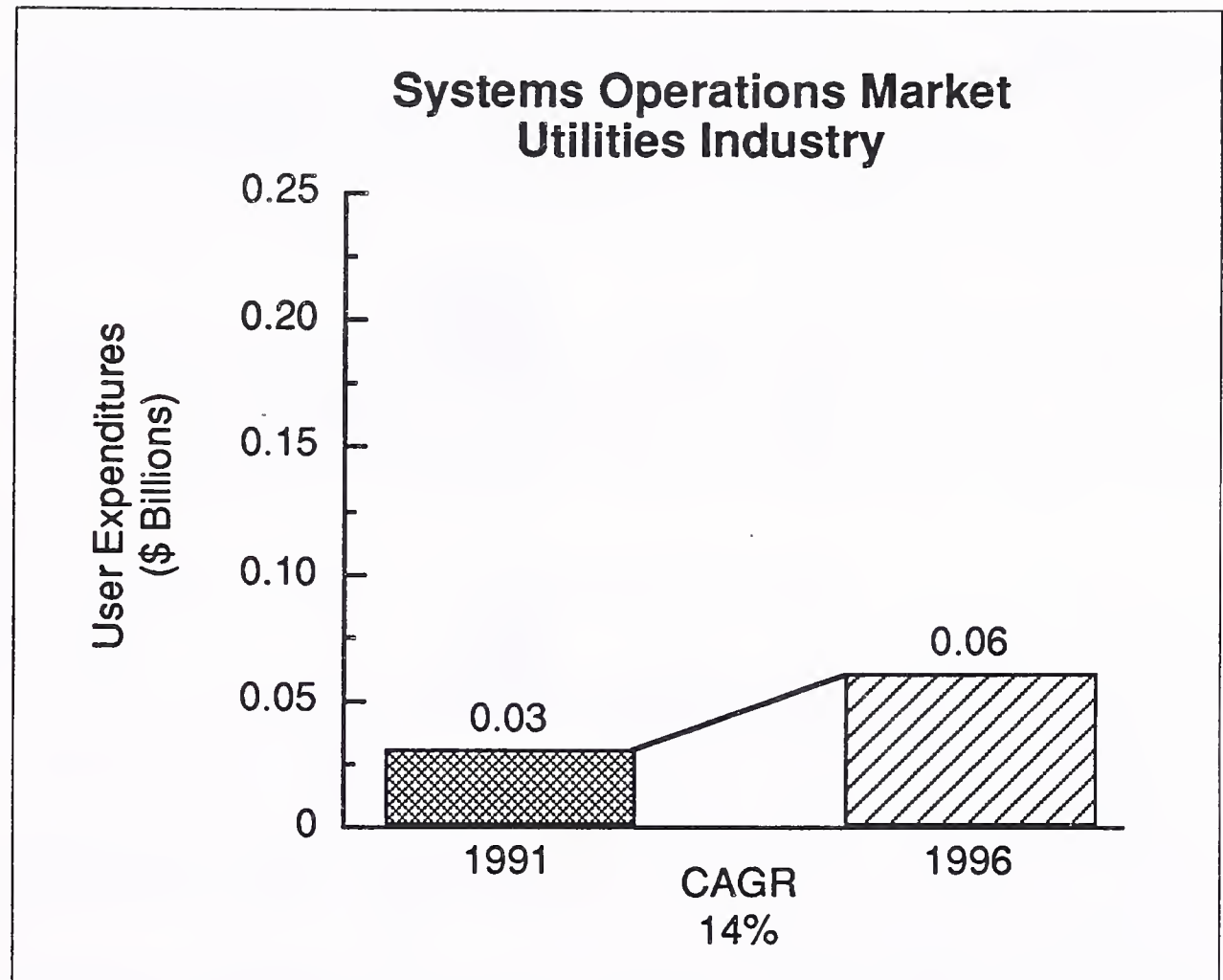
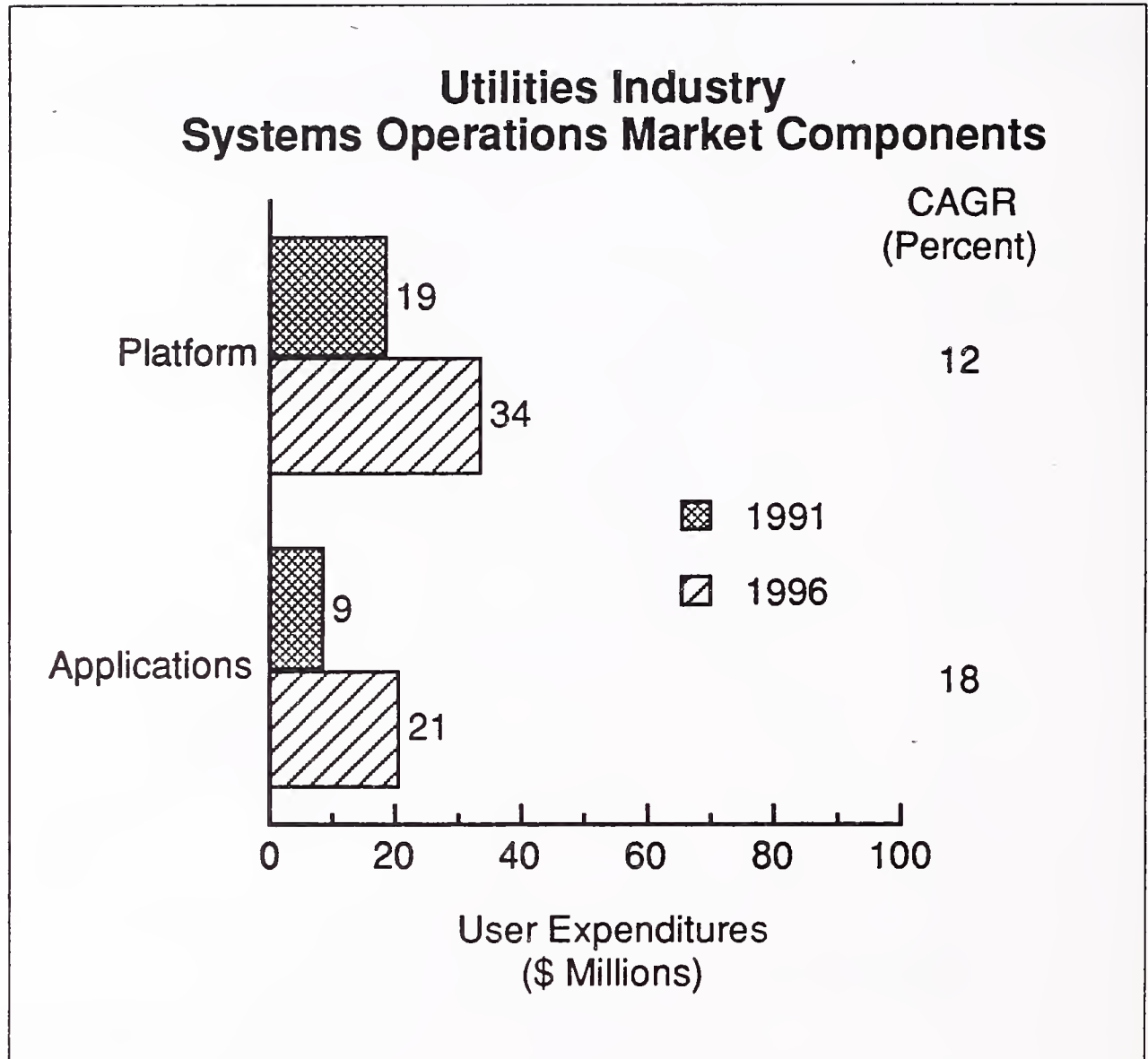


Exhibit IV-24 illustrates how applications processing, despite its small expenditure base, will grow in the 1991-1996 period. Applications processing should exhibit the same general tendencies as in other vertical markets and grow more rapidly over the forecast period.

The industry continues to be in-house-oriented because of the incentive to invest in hardware. No major vendor has penetrated this barrier yet. MCN, the data processing subsidiary of Michigan Consolidated Gas, recently merged with Genix Group, a force in the manufacturing sector of the systems operations market. This new relationship has not led to any new penetration, though the new entity can certainly provide expertise in the utilities sector. Power Computing has also reported activity in this sector, particularly in providing CDC-based services (Duke Power Computing is a recent contract), but very few other suppliers can be identified.

EXHIBIT IV-24



I

Telecommunications Industry

This sector is composed of the major providers of telecommunications—AT&T, MCI, Sprint, GTE, the Regional Bell Operating Companies (RBOCs), independent local exchange carriers, long-distance resellers, 800 and 900 services, and cellular phone operators—as well as companies providing broadcasting, cable TV, and optical fiber and satellite networks. As the media available for information transfer become more varied, this sector may be better described as the “electronic communications industry.”

1. Industry Forces

The telecommunications industry continues to post nominal growth overall, but this is beginning to change. Vendors such as AT&T and MCI report substantial gains, and subsectors such as cellular phone and VSAT show significant growth potential.

Merger activities reflect an industry need to dominate or establish presence in selected markets and to place greater emphasis on service rather than circuit capacity. MCI's acquisition of an equity interest in INFONET and the acquisition of TELCOM-ONE are notable examples, as is the CONTEL/GTE merger. AT&T's acquisition of Western Union electronic mail service is another.

Although substantial investments are being made, the industry is still in a holding pattern until the next round of liberalization takes effect. Most RBOCs are preparing to provide additional information services. Meanwhile, independent companies are positioning themselves to be end-to-end providers of information services.

2. Impact on Information Systems and Services

In addition to the competition that deregulation fostered, Bell telecommunications companies lost a major source of IS support when they were separated from AT&T. This lost capability is now replaced by in-house capabilities or by external systems operations vendors. Bell companies also lost data processing resources to cost-cutting measures, creating even greater opportunities for outsourcing to vendors.

The new and emerging information carriers—such as cable, TELETEX, and cellular systems—are already using IS to operate billing, traffic and programming management, maintenance scheduling, and marketing programs. Their need for flexibility of services, connectivity among operating elements, and response to changing market conditions may cause them to seek external resources since these carriers are not regulated sectors of the industry and gain no advantage in procuring hardware.

3. Systems Operations Potential

With the tendency for the major communications providers to maintain a large internal processing capacity, the challenge for systems operations vendors is to identify certain niches where they can provide added value. McDonnell Douglas, for example, has identified a CAD/CAM market where it can provide expertise to the network engineering departments of the major communications providers.

Certain major independents and the RBOCs have been outsourcing much of their labor requirements, including the operations of data centers. In those cases, the management of the data center remains the purview of the client, but this tendency should be watched, as it provides an opportunity for systems operations.

In other sectors of the communications market, the SO potential should be greater. Many of the new, emerging firms in the cellular phone and cable TV industry need the billing, problem tracking, scheduling software, and processing capacity that vendors have available now. SO vendors may be competing with RBOC data processing departments that are also positioned to service this market, but this potential should be noted.

The highly unionized workforce in the telecommunications industry is a negative factor for the penetration of certain sectors of this market. Exhibit IV-25 illustrates some of the positive and negative forces in this marketplace.

EXHIBIT IV-25

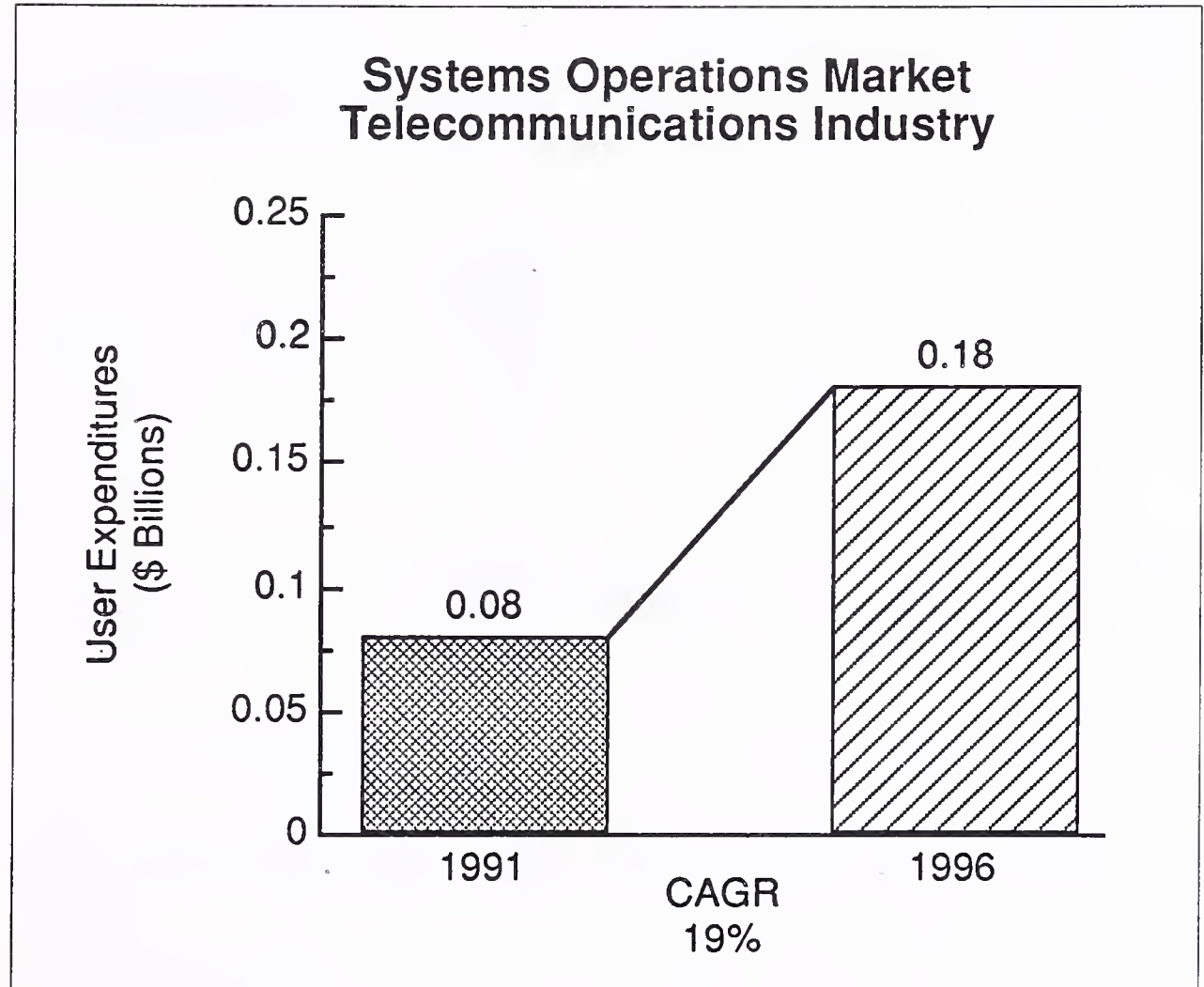
Key Factors in Telecommunications Industry

- Positive
 - New industry sectors lack IS skills
 - Widening range of services requiring support
 - General health of telecommunications industry
- Negative
 - Desire to keep hardware in-house
 - Perceived in-house technical skills
 - Highly unionized workforce

4. Systems Operations Forecast

INPUT projects the CAGR for this industry over the period from 1991 to 1996 to be 19%, higher than the projection for last year. This is illustrated in Exhibit IV-26. The barriers to penetration mentioned above—highly unionized workforce and heavy investment in computer equipment—are yielding to the need for more cost-effective solutions to mounting budget pressures.

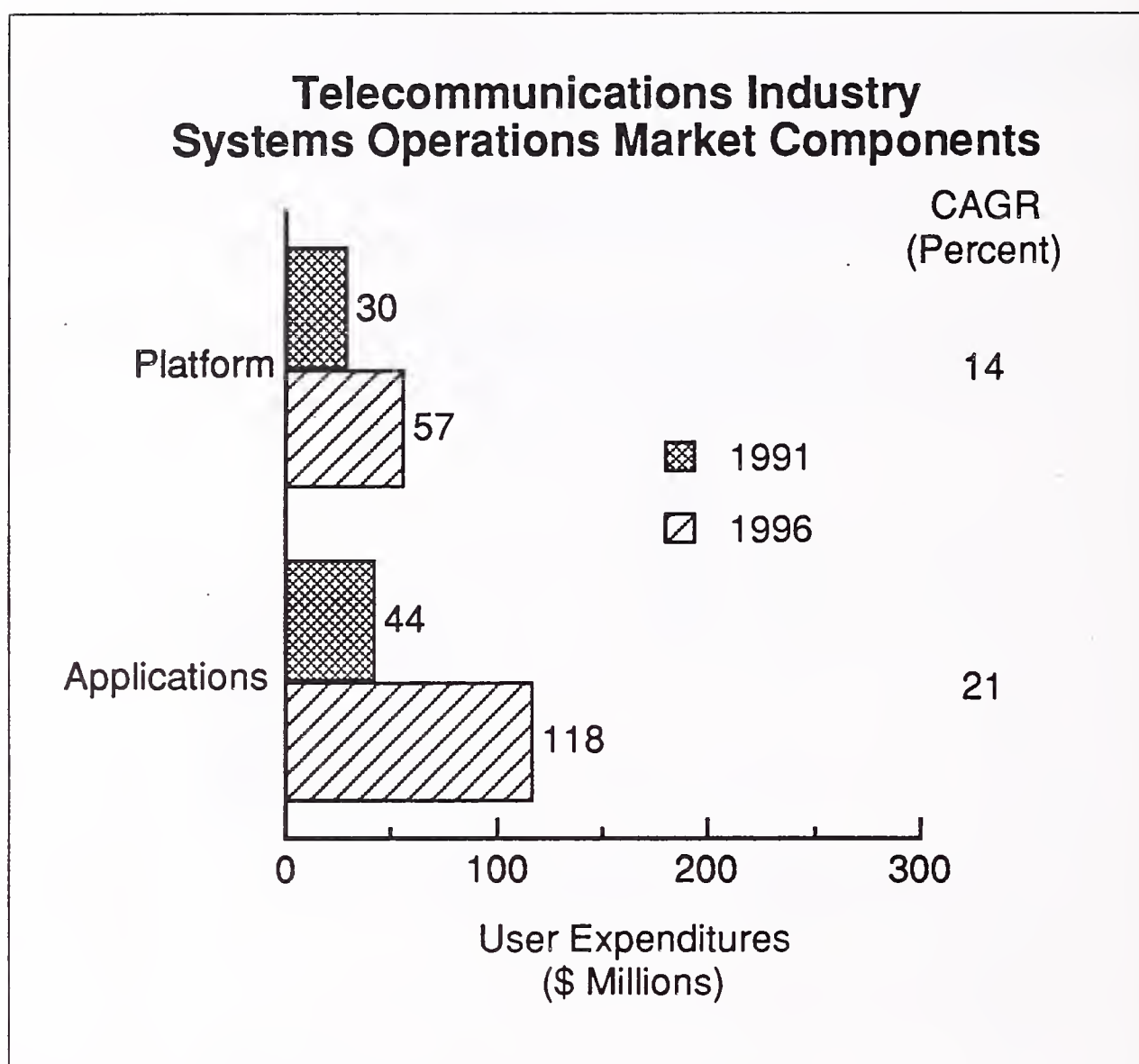
EXHIBIT IV-26



From Exhibit IV-27, it is apparent that there is an imbalance in the growth rate between the application type and the platform type (21% and 14%, respectively) for the telecommunications industry. This is a function both of the vendors—primarily the RBOCs and professional services companies—and of the fact that the smaller companies in this industry—the most likely prospects—are looking for total solutions from vendors, not just platform processing solutions.

When assessing the prime vendors in this industry, Cincinnati Bell Information Services, Ameritech, and U.S. West stand out as providing services to the smaller independents. They are actively pursuing this marketplace and can offer industry expertise and processing capacity that is hard to match. Other companies, such as McDonnell Douglas and Telos, have found particular applications niches that they continue to exploit. Some vendors with professional services roots, such as Andersen Consulting, AMS, and SHL Systemhouse, also report revenues in this industry sector.

EXHIBIT IV-27



J

Retail Distribution Industry

The retail distribution sector includes single establishments and chains in apparel, food, appliances, drugs, hardware, etc.

1. Industry Forces

The sluggish economy and other gloomy economic outlooks—higher interest rates, oil prices, taxes and a large price tag on the S&L bailout—have caused consumers to cut back on their spending. Seasonally adjusted, retail sales have continued to drop and are expected to rebound only slightly as the economic downturn begins to bottom out. Increased competition and a battle for market share are likely to develop.

There are only 800 large retailers among the more than one million companies that are the principal targets for systems operations vendors in the immediate future. The emphasis of these companies will be on improving internal systems and integrating external communications.

Externally, communication with suppliers is very important. Better communication links facilitate the flow between customers, outlets, retailers, and wholesalers. The use of information systems for credit checking and POS data collection ensures the steady flow of funds while monitoring inventory. Back-office use of computer-to-computer order processing increases the speed of locating and delivering merchandise.

Internally, the primary use of automation thus far is in applications for closely monitoring finances, supporting financial decisions, and analyzing profit margins, but not for providing strategic management decision information.

Since management is concerned with the increasing communications costs required to support broader networks, it sees the use of outsourced services as the only way to simultaneously control costs, track customer buying patterns, manage inventory, and match merchandise to buyer interests.

2. Impact on Information Systems and Services

The mission of IS, given the broad diversity of products handled by each outlet, is to provide systems that control logistics associated with warehouse and shelf inventory, pricing and obsolescence of goods, etc., while also handling the logistics of credit/bad check verification, bad credit losses, cash handling, and funds consolidation and transfer.

IS is also expected to provide customer-oriented services for faster and simpler order entry, transaction processing, in-store processing (distributed processing), and the use of such technologies as EDI to reduce paperwork.

Provision by IS of real-time information for improved decisions by management means improved marketing/sales data, sales demand forecasting by demographic areas, vendor performance ratings, telemarketing systems, and inventory deployment models.

Increased integration of data processing and communications in the retail distribution industry appears to be essential to provide on-line connectivity of all operating elements, distributed processing to all locations, and end-user support throughout the organization.

3. Systems Operations Potential

Most IS managers feel their applications needs are very specialized, so few are looking for extensive applications support. They feel platform outsourcing is where they can reap substantial benefits.

Small margins, low investment capital availability, increasing labor costs, and rising facility costs have discouraged frequent use of outside services, except when considered absolutely essential. Respondents in the mail-order sector appear especially reluctant to outsource.

Retail establishments have rediscovered the critical importance of customer service to ensure repeat sales. Among the tools being employed are rapid credit checks and multiple payment methods, early warehouse response to local out-of-stock requests, telemarketing services, and accurate tracking of shipments to clients. All of these depend on rapid and accurate transfer of information that may exceed current systems network capabilities.

The large number of medium-sized firms have traditionally not been driven by the need for automated solutions as much as by merchandising skill. But this situation is changing. As large wholesalers and retailers find their margins shrinking even further in a more competitive environment, they are acquiring some of these firms and creating new IS consolidation requirements that can't be met by internal staff. Exhibit IV-28 illustrates the positive and negative factors at work in this market.

EXHIBIT IV-28

Key Factors in Retail Distribution Industry

- Positive
 - Strong need for attention to customer service
 - Drive to higher inventory turnover
 - Mergers and consolidations of retail outlets
- Negative
 - Infrequent user of outside services
 - Smaller-than-average IS expenditure
 - Financial problems in retail chains
 - Low profit margins across industry

4. Systems Operations Forecast

The forecast for this market sector, shown in Exhibit IV-29, indicates that the growth continues at just above last year's projection of a 24% CAGR. As mentioned above, the need for consolidation of support services, stimulated by a rash of mergers, acquisitions and retrenchments in the retail sector, has made the market for systems operations particularly attractive. The emergence of IBM as a strong vendor in this market has added a cachet of acceptance to the outsourcing decision, so that others are bound to follow.

EXHIBIT IV-29

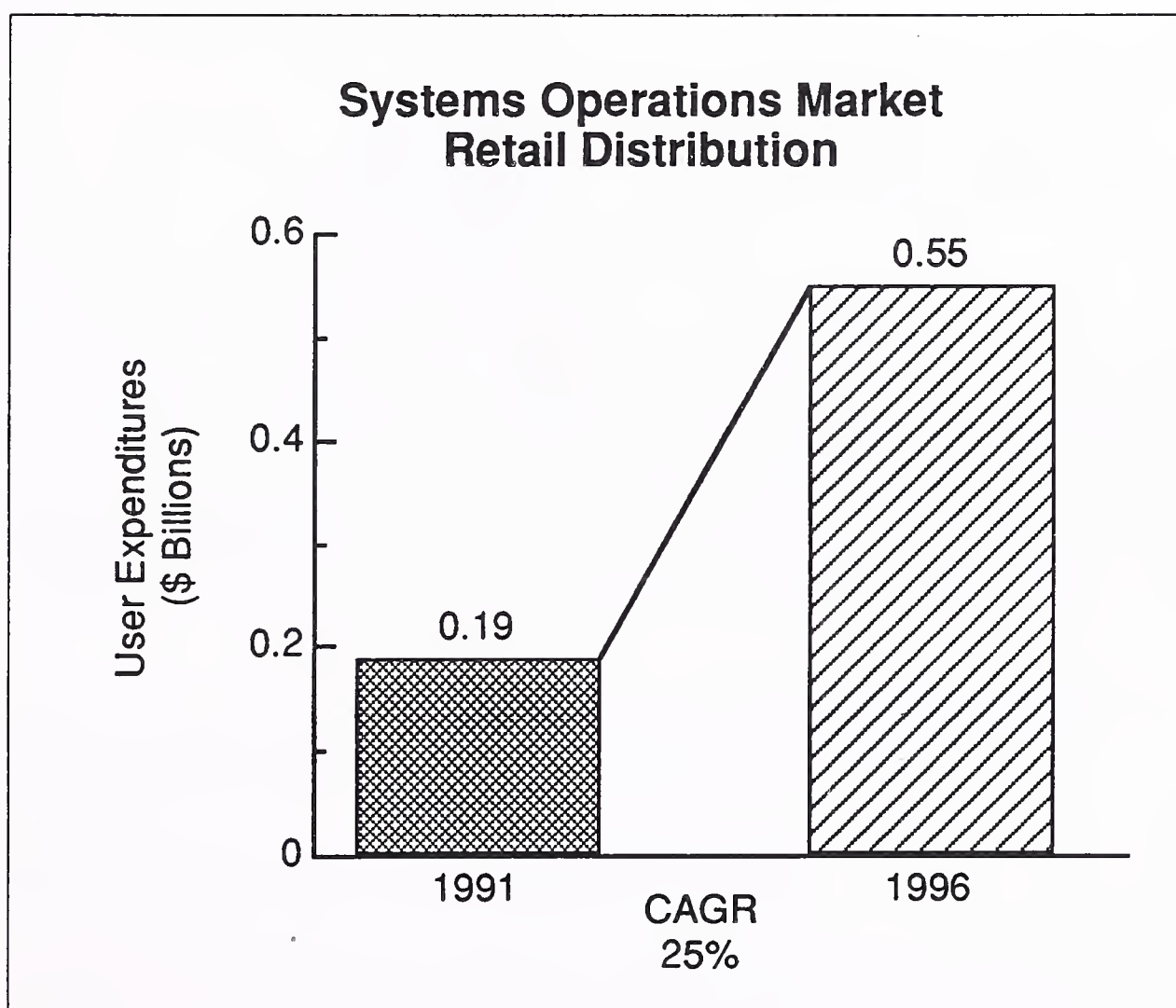
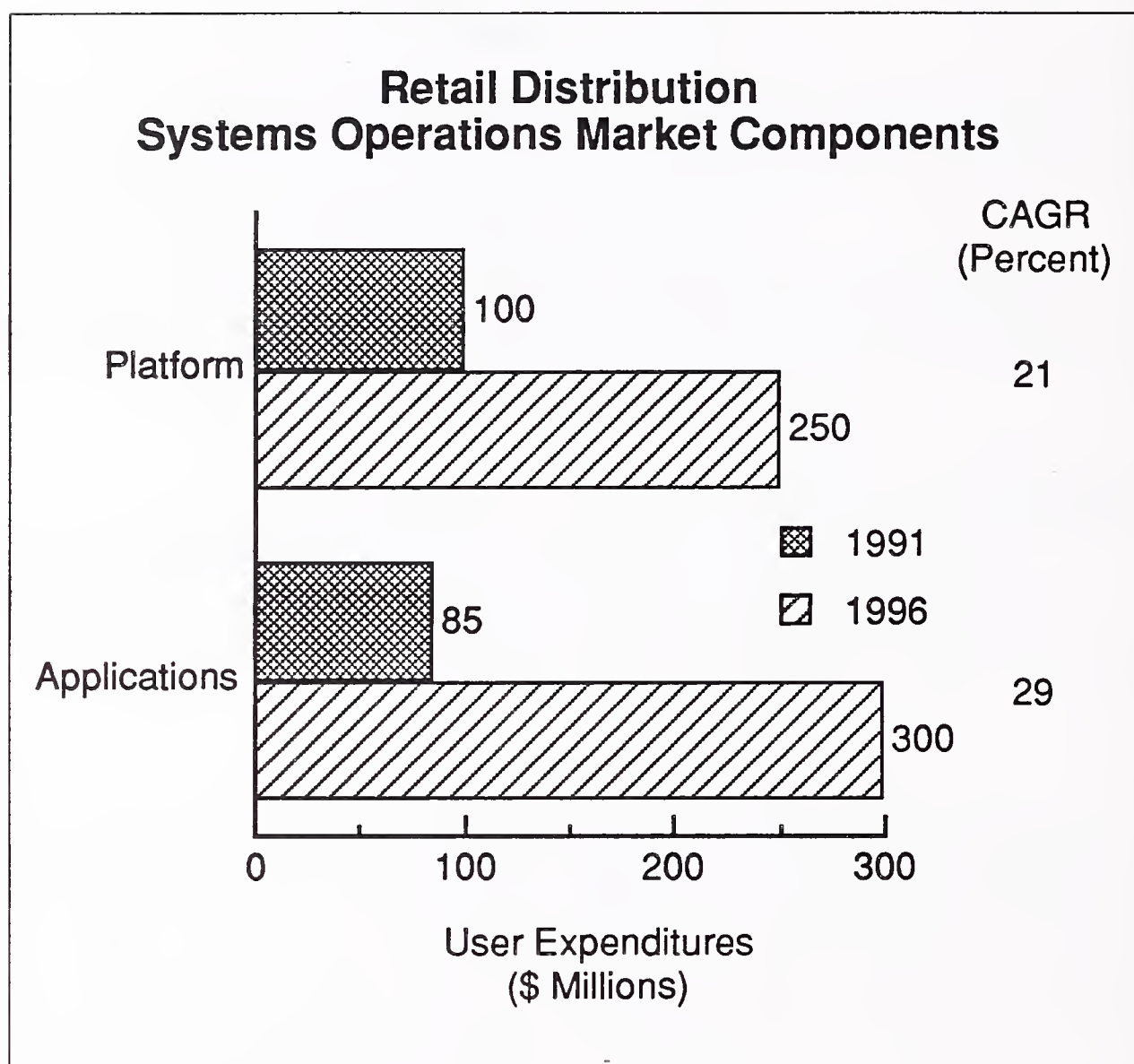


Exhibit IV-30 presents the user expenditure split between applications and platform processing for the forecast period. Applications processing becomes much more dominant in this vertical industry, as the vendors become more familiar with the applications on which the clients are dependent. An example of this trend is CSC's parlaying its medical claims experience into a processing contract with the optical distributor, Pearle Vision.

EXHIBIT IV-30



As mentioned above, the standard vendor is IBM, which has scored four hits in the first three quarters of 1991 in this sector. It capitalized on its prior penetration in this market with equipment. More specialized systems operations vendors, notably ACS Commercial Services and the Sabre Division of Federated Stores, have a large share of the revenue in this sector because they have built up a solid base of experience in retail distribution that inspires confidence in prospects. ACS, for example, is processing all work for the Southland Corporation and Builder's Emporium.

K

Wholesale Distribution Industry

This sector includes establishments that sell goods to retailers or industrial/commercial/institutional groups acting as brokers.

1. Industry Forces

The wholesale distribution market includes a number of widely different submarkets with equally different growth rates. Some very large wholesale establishments are leading-edge users of information technology. However, many more—in the thousands—are very small and employ only a minimum of IS technology. There are three types of firms: independent distributors (merchant wholesalers), which account for about 55% of sales; manufacturer's sales branches, which generate about 35% of sales revenues; and agents and brokers, which handle somewhat less than 10% of sales and whose numbers are diminishing.

1990 winners in this sector include paper, petroleum, machinery, lumber, and farm products. Areas that lost market share or revenue were autos, auto parts and metals. The impact on IS is unclear, because firms with losses are now improving their market positions with updated resources.

Measures to ease the pressure on margins include increased inventory turnover, secured high-volume purchases, longer and larger purchase commitments, and system improvements that contribute to the bottom line by enabling rapid response and deployment of products. Better communications will accelerate the information flow between wholesalers, retailers, and manufacturers/sources of goods. EDI has potential to accelerate the flow and reduce order-processing costs. Back-office use of computer-to-computer order processing will reduce the time needed to locate and deliver merchandise.

Automation is viewed as a matter of survival by the independents and manufacturing branches. The leaders forecast an aggressive use of computer and communications technology.

2. Impact on Information Systems and Services

In medium-sized to large wholesale organizations, IS is faced with meeting rising management expectations. It must also satisfy increasing demands for the integration of data and applications while managing the limited technical investment. The mission is complicated by the traditional instability of the sales-oriented organizational environment and its varying use of information services. IS is also faced with the increasing importance of data integrity in an environment where PCs are beginning to proliferate. Proposed solutions must be proven in the market to support early payoff.

Productivity of the IS staff is frequently impacted by varying backlogs of short-term or one-time application demands. Users in sales, management, and traffic are demanding increasingly complex tools, such as new workstations, upgraded applications, and on-line teleprocessing to gain a competitive edge. To meet these demands, IS is looking to outsourcing vendors to provide less expensive processing facilities, expanded connectivity, and network techniques such as EDI.

Conversely, the cost constraints limit the level and availability of the in-house staff to address these issues with the latest technology, while meeting day-to-day service requirements. In addition, IS managers are having difficulty gaining meaningful insight into future industry directions that would influence the selection of information technologies.

Like the retail distributors, wholesale distributors have not made use of outside services, except for hardware maintenance and essential software support. In an industry largely guided by merchandising intuition, that uses relatively small IS staffs and is financially constrained by narrow margins, there has been minimal outsourcing of systems operations.

3. Systems Operations Potential

There are approximately 30,000 wholesale distributors with between \$5 million and \$20 million in annual sales, plus another 6,000 with sales in excess of \$25 million. This large and diverse base of prospects is faced with the need to automate, but lacks the skilled in-house resources to accomplish it. Only the largest distributors have adequate staff to change the way they address market needs. Many of the smaller firms look to the large firms for direction. Exhibit IV-31 summarizes the market factors.

Part of the lack of penetration in this vertical market is attributable to the existence of widely different submarkets. SO vendors' experience is seen as relatively narrow. Each submarket sees itself as having unique requirements that can only be addressed by knowledgeable specialists.

From a systems operations viewpoint, however, this market offers broad challenges that could be addressed by technology and tools already employed successfully in other markets. The marketing of SO capabilities has to offer phased transition over time to minimize the impact on day-to-day operations.

EXHIBIT IV-31

Key Factors in Wholesale Distribution Industry

- Positive
 - Network requirements for retail access
 - Strong interest in inventory controls
 - Automation needed for survival
- Negative
 - Cost pressures/low margins
 - Need to keep operations running during transitions
 - Widely different submarkets
 - Many small wholesalers

4. Systems Operations Forecast

The wholesale distribution sector is expected to grow at 18% for the period 1991 to 1996. This segment starts with a low base and continues to be a small portion of the total systems operations market. Exhibit IV-32 illustrates the market forecast.

EXHIBIT IV-32

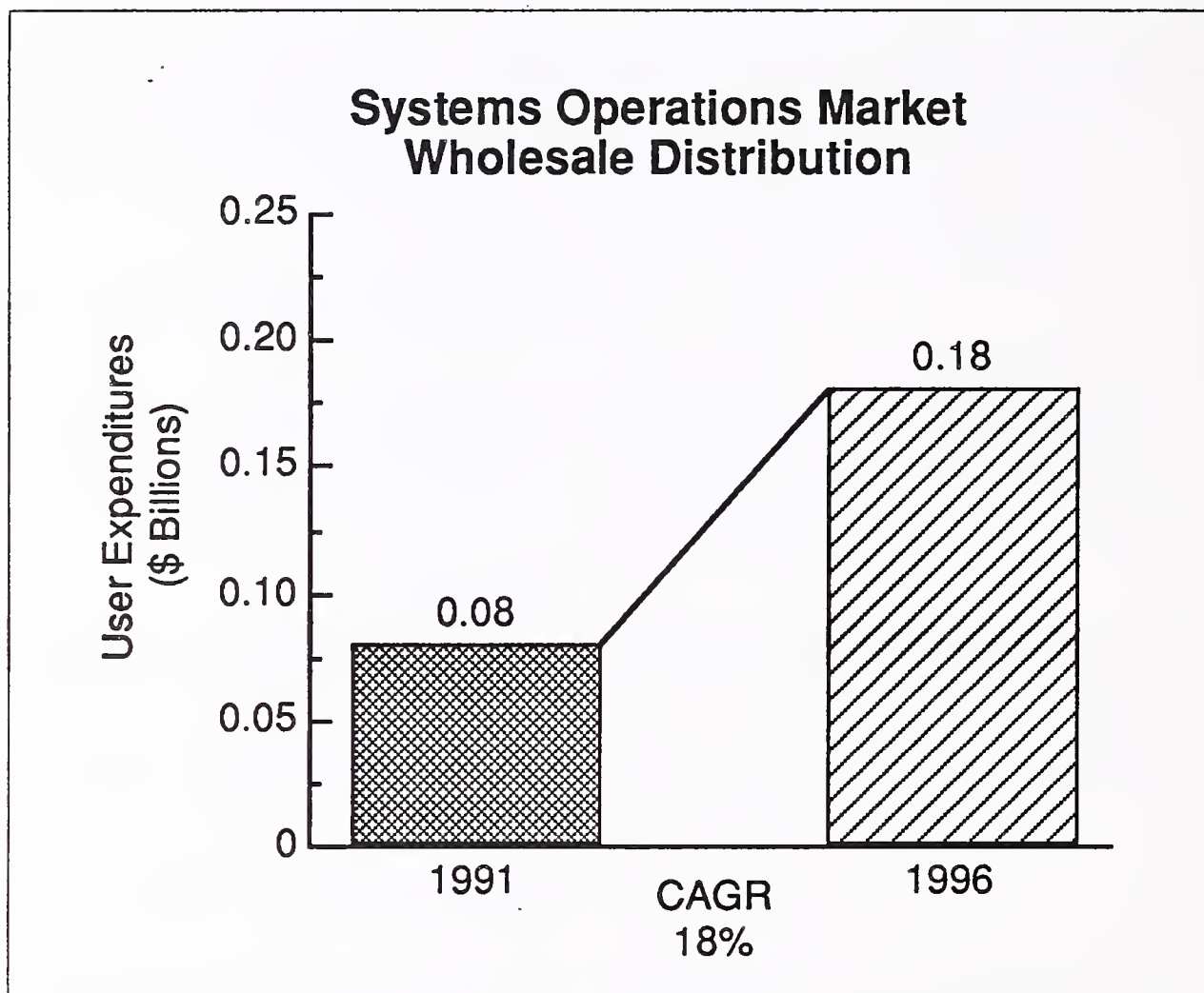
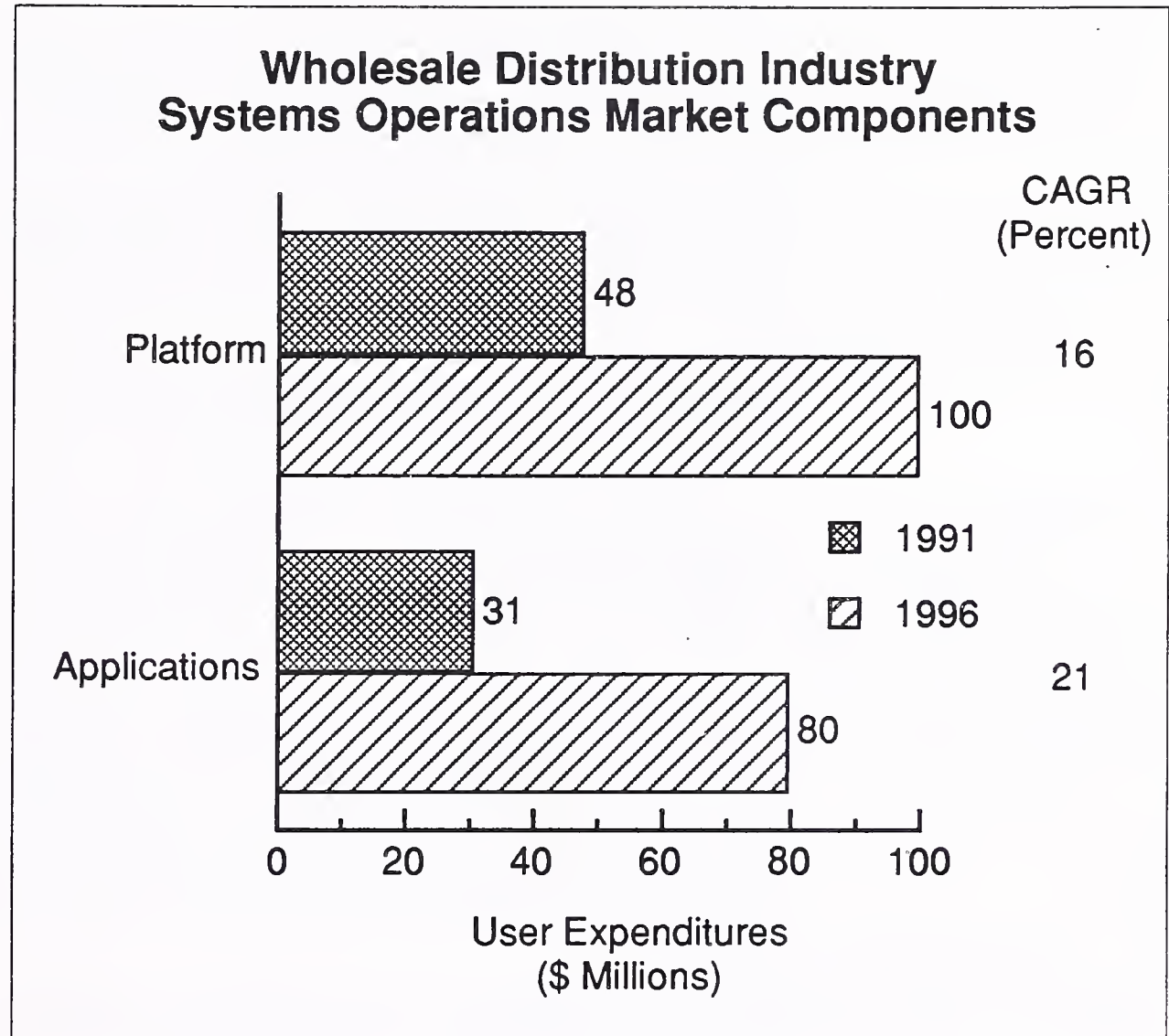


Exhibit IV-33 illustrates that more of the processing in this vertical industry is platform systems operations. Most clients indicate they know their business best and will not entrust software to vendors. This trend will continue, though the growth rate for applications systems operations will accelerate by 1996.

Martin Marietta recently entered the commercial market with a contract at Monarch Foods, a large grocery wholesaler in the mid-Atlantic region. User respondents still indicate that they do not find any vendor with expertise in the wholesale distribution business. Certain large wholesalers—particularly agricultural cooperatives such as Agway and Land O'Lakes—do processing for smaller co-ops in their submarket, but this pattern does not seem to occur in other submarkets.

EXHIBIT IV-33



L

Insurance Industry

This sector is composed of life, property, casualty, and health insurance; the reinsurance segment of agents and brokers; and health services claims processing.

1. Industry Forces

The insurance industry is highly competitive. In addition to competition from traditional providers, many are facing further dilution of market shares by the potential entry of banks and foreign competitors.

Foreign competition is generally associated with industries other than insurance. However, U.S. insurance companies have an estimated 28,000 affiliates abroad through which they sell insurance. That's on the plus side. On the minus side, approximately one-third of premiums in this country are paid to foreign-owned companies. While the overall trade impact continues to be fairly small, the data suggests that insurance is becoming as much a global activity as manufacturing or banking.

Financial institutions have made their appearance in the insurance market as competitors by offering "benefit consultants", "financial planners", and "full-service" business planners. Response to this influx of financial institutions has led to new insurance products with more complex premium calculations and to diversification into financial areas and interest-sensitive products. Controversial legislation concerning the entrance of banks into this market is currently being debated in the U.S. Congress.

Other problems face the industry in the form of increased liabilities from court actions, a growing elderly population with increasing dollar out-payment levels, the AIDS epidemic, some bad investments in junk bonds and commercial real estate, and consumers' concerns about insurance availability and coverage. Possible opportunities for the industry include the opening of markets in Eastern Europe, Japan, and the rest of the Pacific Rim.

Overall, the industry is relatively stable and should remain that way. Opportunity for information services vendors appears to be positive, now that more automation is required and more connectivity is needed between each agency and home office.

2. Impact on Information Systems and Services

Increased competition and lackluster performance in the investment community are causing insurance companies to reduce costs by improving efficiency. Improvement of operations and increased productivity will most likely be accomplished through a reduced workforce, increased capabilities of existing systems, the automation of additional functions, and the outsourcing of processing functions to third-party vendors.

In a new role, IS supports the effective management of change, the anticipation of systems needs for new product lines, and the provision of immediate IS support. System flexibility is essential to accommodate more products, improve customer services and sales, and permit nationwide system consolidation across all lines of business. Intra- and intercompany businesses will require a level of compatibility among systems on the same order as the banking/finance industry.

Insurance companies need more timely information, especially in claims administration, to write better and more-competitive policies. Access to mainframe data through well-managed communications capabilities will improve user efficiency to offset some of the ongoing staff reductions.

There are requirements for building an infrastructure to support agents in the field, by giving them a sales support system and by networking within and between offices. Artificial intelligence and expert systems are expected to play an increasingly important role in applications such as underwriting, risk management, investment planning, policy customization, and health services review analysis.

One technology that is of growing importance to the insurance industry is electronic imaging. Faced with a never-ending flood of paperwork, insurance companies are increasingly interested in technology that will reduce the cost of managing paper records. All recognize the benefits of electronic imaging. All also recognize that they are constrained both by lack of high throughput telecommunications services to connect electronic imaging systems to field offices and lack of internal expertise to design, install and operate these systems.

3. Systems Operations Potential

Continued scrutiny of health care costs, and public awareness of the escalation of these costs, have created increased opportunities for vendors skilled at administering cost-control systems.

Most personnel in insurance company IS departments are assigned to maintenance, resulting in a shortage of capabilities in the more sophisticated technologies currently in demand. IS managers in this industry note the importance of project management skills in design and implementation of networked systems, and the frequent lack of these skills within the in-house staff. Systems operations vendors can provide these skills more effectively.

Many of the systems operations opportunities in this industry are in the medical claims processing sector. As in every vertical market, there is a strong preference for demonstrated industry-specific knowledge. This requirement tends to favor SO vendors with extensive insurance and financial systems experience. This sector has had a number of systems integration projects in the past that ran into major problems. Financial and schedule overruns were severe, and a resurgence of the industry's self-sufficiency mentality has resulted. Particularly within larger companies, the feeling is that information services are too critical to let them be performed by an outside vendor. Only in small and medium-sized companies does there appear to be an understanding of the cost effectiveness of SO.

Exhibit IV-34 summarizes the positive and negative factors at work in the insurance market. The counterbalancing forces will continue to dampen growth in this industry until one major insurance company chooses outsourcing as the route to a more cost-effective operation. The large multi-functional companies set the trends in this industry, and any large contract could cause a band wagon effect to develop and radically change the growth rate for systems operations in the insurance industry.

EXHIBIT IV-34

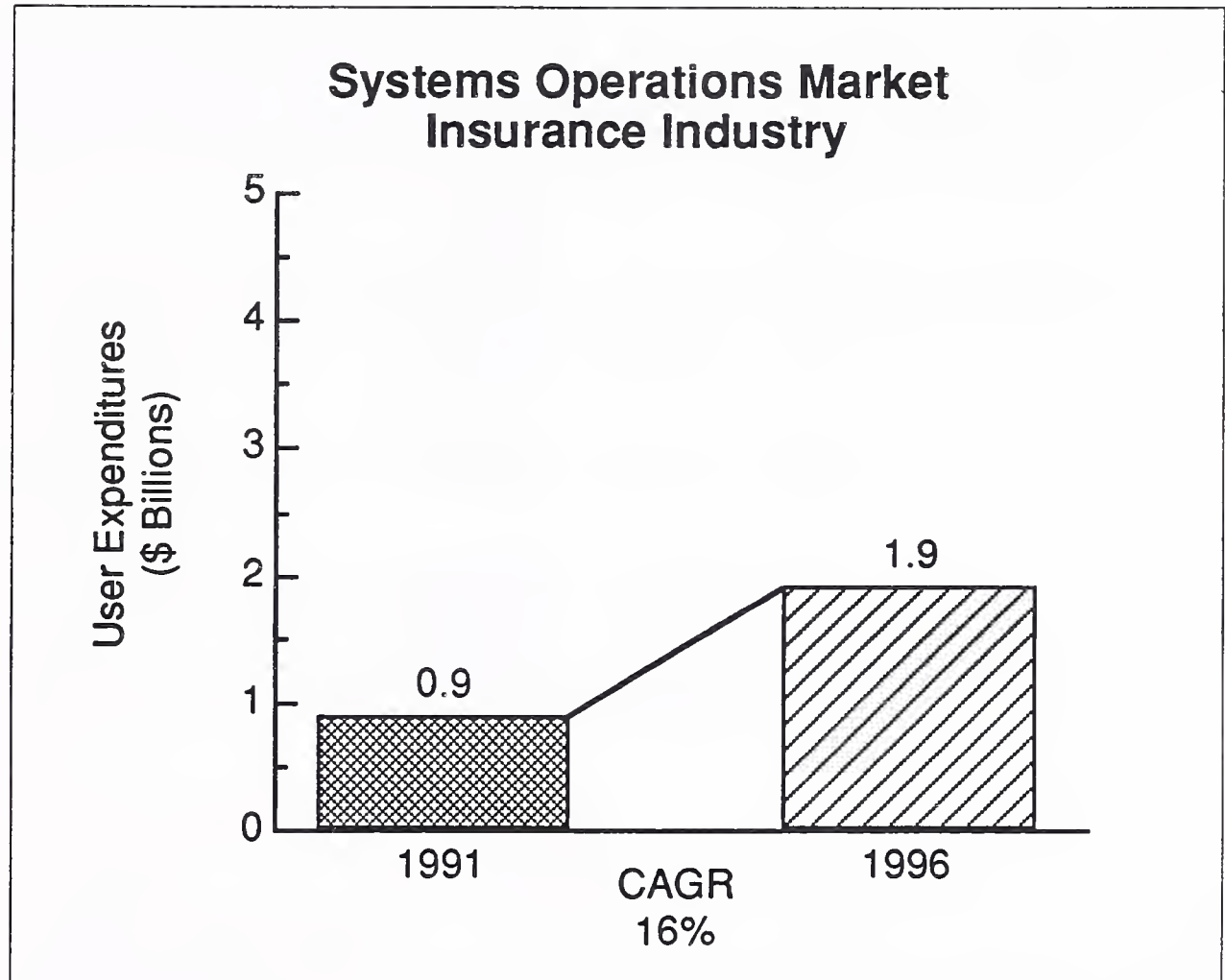
Key Factors in Insurance Industry

- Positive
 - Growth in health insurance requirements
 - Lack of personnel for new projects
 - Need for on-line policyholder/client information
 - Continued pressure for increased efficiency
- Negative
 - Cost controls limit new starts
 - Large insurers set trends
 - Self-sufficiency mentality

4. Systems Operations Forecast

There has been a major change in the long-term growth rate for this industry. Although INPUT had reported a 1990-1995 growth rate of 10%, the current forecast is a 16% growth rate for the five-year period from 1991-1996, as shown in Exhibit IV-35. This reflects increased cost pressures in most sectors of the insurance market. The increased emphasis on health care cost containment also has helped to offset the overall slowdown in the insurance industry.

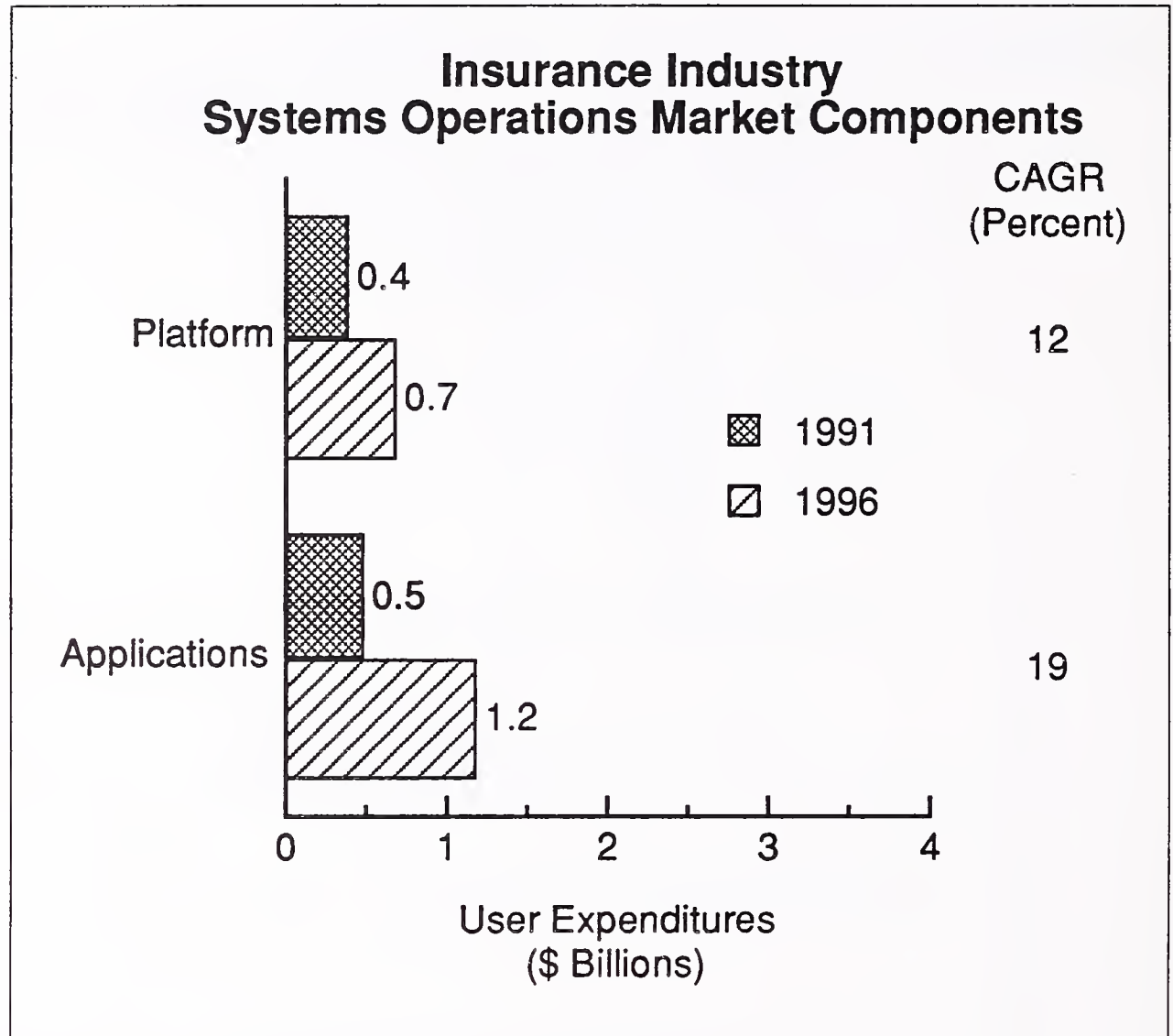
EXHIBIT IV-35



Applications processing continues to be the dominant mode in the insurance industry through 1996, as shown in Exhibit IV-36. Platform operations is growing at 12% over the period, while applications operations is growing at a 19% rate.

Successful SO vendors in the insurance market will need to demonstrate experience in this sector. EDS and CSC, for example, have demonstrated success in medical claims processing, both in federal contracts (CHAMPUS) and as Blue Cross/Blue Shield service providers. Industry specialists such as Continuum, ISI Systems, and Policy Management Systems build upon their prior insurance claims processing experience in this industry, as well as on proprietary software. This pattern is expected to continue; the ticket to enter this marketplace is demonstrated experience, which favors the incumbent vendors.

EXHIBIT IV-36



M

Education Industry

The education sector is subdivided into two segments—academic and industry/commercial. The academic segment comprises public and private institutions that provide basic education from kindergarten through 12th grade, vocational schooling, community colleges, and institutions of higher learning for undergraduate and graduate study.

The industry/commercial segment is comprised of organizations that provide private educational services such as private business and technical schools.

1. Industry Forces

Education continues to receive a great deal of attention as reports comparing test results of U.S. students to those of students in other countries show the U.S. trailing in the quality of education.

The current administration has placed emphasis on this area and is receiving strong support from industry. This should result in increased focus and spending for systems that will result in improved academic achievement. There are, however, a number of factors that constrain the use of information services within the educational market. They include:

- Flattening enrollment patterns that result from decreasing family size, although there continues to be an emphasis on post-high school education
- Constrained funding sources that result from state and local funding and spending limits

2. Impact on Information Systems and Services

The four major areas of opportunity for information-based solutions in education are:

- Administrative applications
- Academic/courseware applications
- Research
- Library applications

Larger educational institutions employ IS staffs to operate academic and business centers. Academic support includes timesharing mainframes and interconnected microcomputers for computer studies, research, and courseware. Administrative functions include class and teacher scheduling, student records, building and equipment maintenance, and the usual range of payroll, finance, and accounting functions. Library functions may be controlled by the academic or administrative staff or operated separately.

The increased focus on improving the quality of education should begin to improve spending in areas that will have the most impact on academic results. This should include spending for more microcomputers and courseware in the K-12 arena and networking of capabilities within and among campuses.

Industry also appears willing to spend in areas that will better prepare students in technical areas in which it believes the U.S. is trailing, but are essential for industry to be competitive. Expenditures for systems to improve computer science skills and to perform research in advanced applications areas such as artificial intelligence, groupware, and CIM should be anticipated.

Large private colleges and state university systems will be competing for public and private grants to perform research for the government and industrial companies. The competition will encourage institutions to develop and maintain state-of-the-art research facilities.

Industry is increasing its grants to education in support of the national emphasis on education and to allay its concerns about competitiveness. These research grants require immense amounts of computer processing capability, again available on a campuswide or statewide basis. These grants drive the demand for skills to build and manage supercomputer complexes and network them throughout the research community.

3. Systems Operations Potential

Though education is not a large component of the systems operations market, the commonality of administrative procedures and requirements, coupled with the inability of academic institutions to be competitive with industry in salaries, make the marketplace a viable one for SO vendors with the required expertise. Exhibit IV-37 illustrates the market factors at work in this sector.

EXHIBIT IV-37

Key Factors in Education Industry

- Positive
 - Non-competitive wage scales
 - Network requirements/distributed computing
 - Industry-sponsored research
- Negative
 - Constrained state and local funding
 - Cuts in federal aid programs
 - Political marketing environment

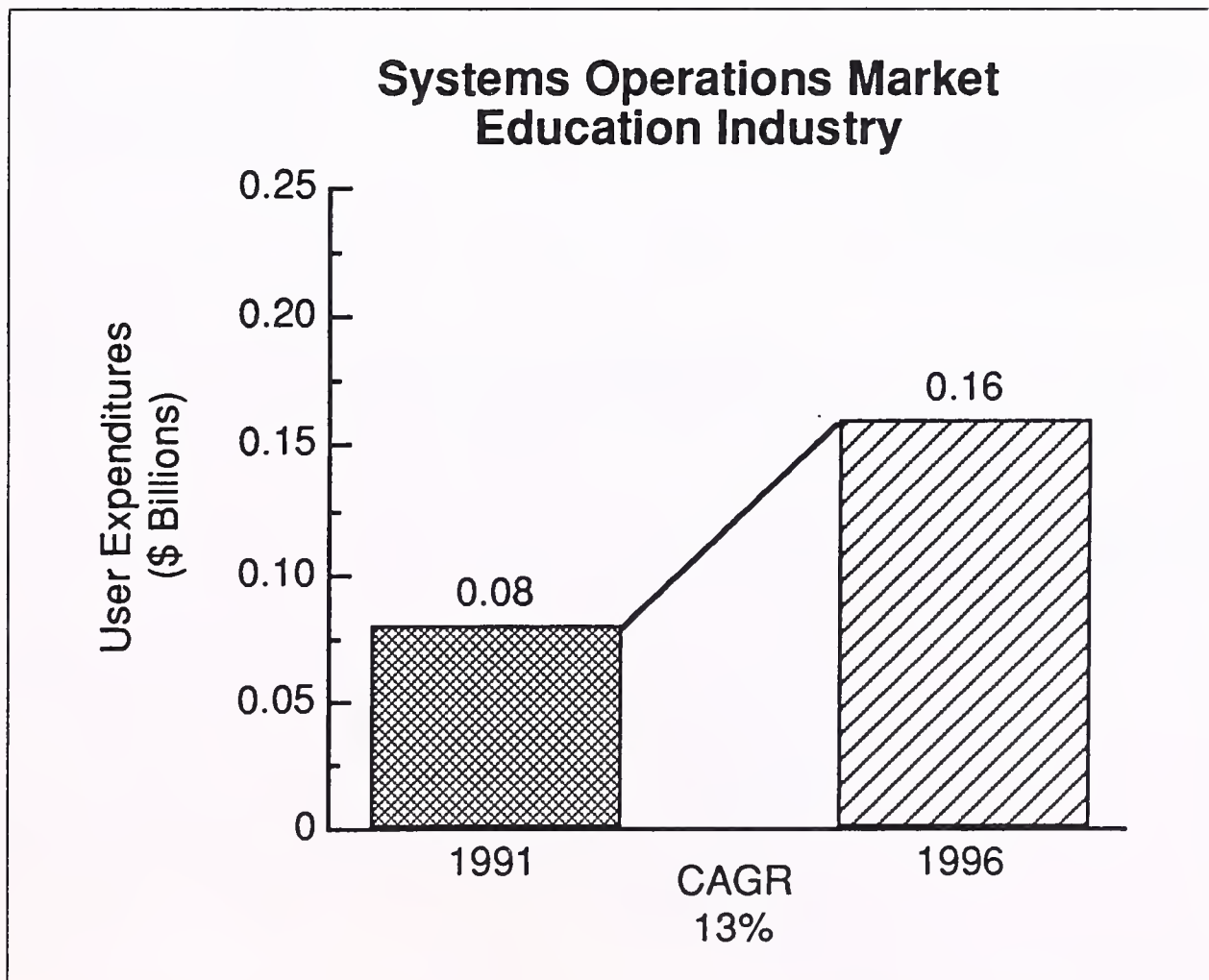
Schools that have gone outside for help have found it effective. Many others are trying to accomplish the task with internal resources. There are both platform and applications opportunities in the education sector. Many IS departments support administrative departments and the research community within the academic environment. Often these services are provided on different platforms. The general-purpose processor used for administrative functions is not what the research community wants for its computation-intensive work. Some schools will benefit from vendors such as SCT that have applications software available to handle student registration, class scheduling, and other administrative functions. Others need to upgrade their computational capacity with supercomputers available from a platform systems operations vendor that provides raw processing power.

The educational market continues to be constrained by budget limitations. There have been, and will continue to be, reductions in federal research grants. This could become a positive pressure for outsourcing to systems operations vendors. Salespeople who know and understand this market can best take advantage of the unique political environment that often requires many rounds of review and approval.

4. Systems Operations Forecast

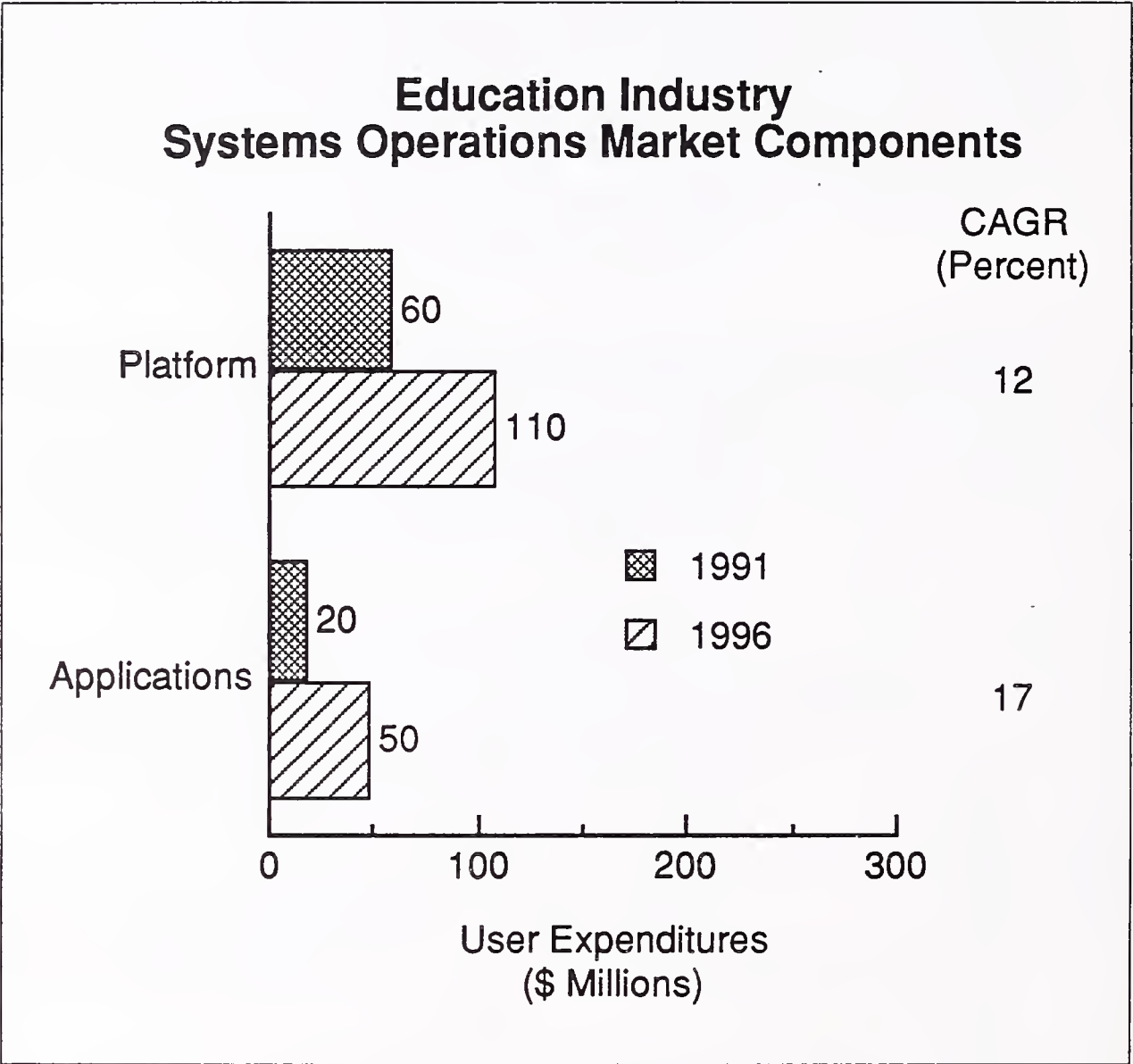
The forecast for systems operations is illustrated in Exhibit IV-38. The growth rate of 13% overall is less than the industry's average of 17%, but slightly up from last year's rate of 12%.

EXHIBIT IV-38



Platform processing continues to be the dominant type of processing in the education industry (see Exhibit IV-39), but this may change as the major vendors become better at providing applications software tailored to the needs of the client. This trend is reinforced by prospects that have more difficulty in recruiting and retaining skilled applications personnel.

EXHIBIT IV-39



System and Computer Technology is a major supplier of systems operations services to the education market, and American Management Systems also reports activity in this sector.

N

Business Services Industry

This sector includes real estate companies, business and legal services firms (excluding hotel reservations), firms providing engineering, accounting, research, management and related services. It also includes the airline reservation business, travel agencies, hotels, and hotel reservation services, the entertainment business in its various forms, automobile services, other repair services, membership organizations, and social service organizations.

1. Industry Forces

A transition is under way in the U.S. from an industrial to a service-oriented economy. According to the Bureau of Labor Statistics, business services are expected to add 2.7 million new jobs between 1988 and 2000. The 2.7 million increase represents almost 1 of every 6 new wage and salary jobs added for all industry sectors between 1988 and 2000.

This growth is in contrast to manufacturing employment, which is projected to shrink slightly, from 19.4 million to 19.1 million at the turn of the century.

Reasons for the trend toward a service economy include:

- Big businesses are increasingly using outside business services—such as for tax work, accounting, and inventory control—in order to contain costs and maintain flexibility.
- The number of small companies is growing; smaller companies do not have a full spectrum of internal resources or know-how. They therefore hire outside sources to set up their books, do their advertising, handle marketing, etc.
- More expertise—that companies do not necessarily need on a full-time basis—is required as the world becomes more complex. It is not cost-effective to provide in-house resources to meet every demand in the course of doing business.

Some of the forces affecting the business services industry are the general economic slowdown, globalization, and expansion into homogeneous markets. With the U.S. economy facing a slowdown, companies are looking to outside business services to reduce their internal costs and keep their businesses focused and flexible. Firms are, in effect, “outsourcing” services other than IS.

In another sector of this market, the hotel industry has been experiencing an oversupply of rooms and weaker demand. To combat this problem, there has been an emphasis on niche markets in different price levels, such as economy accommodations and all-suite accommodations. Hotel reservation systems are becoming more advanced, with central reservation systems appearing that allow reservations for rooms, cars, and airline tickets to be purchased at one location.

The travel service industry is made up of mostly small businesses, with the exception of the airline industry. The airline reservation business continues to struggle and has become more innovative due to deregulation and increased competition. Rental car companies are experimenting with automated reservation terminals, located in airports, that are used to speed up the acquisition process.

2. Impact on Information Systems and Services

This sector is made up of extremes. On one hand, airline and hotel reservation systems represent classical outsourcing functions with large volumes of transactions and a large network component. On the other hand, there are subsegments of this market that are very small and diverse with very unsophisticated IS needs.

The reservation system has long been an area to which the latest IS technology has been applied to improve responsiveness and efficiency in transaction processing. Large mainframes were applied to the task early in the industry's evolution. It also continues to be a very fruitful area for the application of the latest communications technology, and EDI technology has potential for application here.

The demands for technology are driven by a need to be responsive to customer needs. This same need exists among auto dealerships and social service organizations, which have been less quick to adopt the technology.

3. Systems Operations Potential

There is recognized potential in the airline reservation sector that is currently being pursued aggressively by EDS. What started out as a large processing operation owned and managed by the airlines, System One, became a problem as the airlines' financial situation deteriorated due to mergers, acquisitions, and the intensified competition caused by deregulation of the airline industry. The outsourcing of systems operations provides them with a source of cash to be applied to their debt servicing and ongoing operations.

This same cash crunch may be developing in the hotel industry as the economy slows; hotel chains are a prime candidate for systems operations vendors. These same factors may be in motion in the automobile industry as well, in which case the preponderance of independent dealers would make a concentrated thrust much more difficult.

The rest of this sector is made up of small purchasing units that do not appear to be good candidates for anything but niche vendors. Exhibit IV-40 summarizes the forces at work in this market sector.

EXHIBIT IV-40

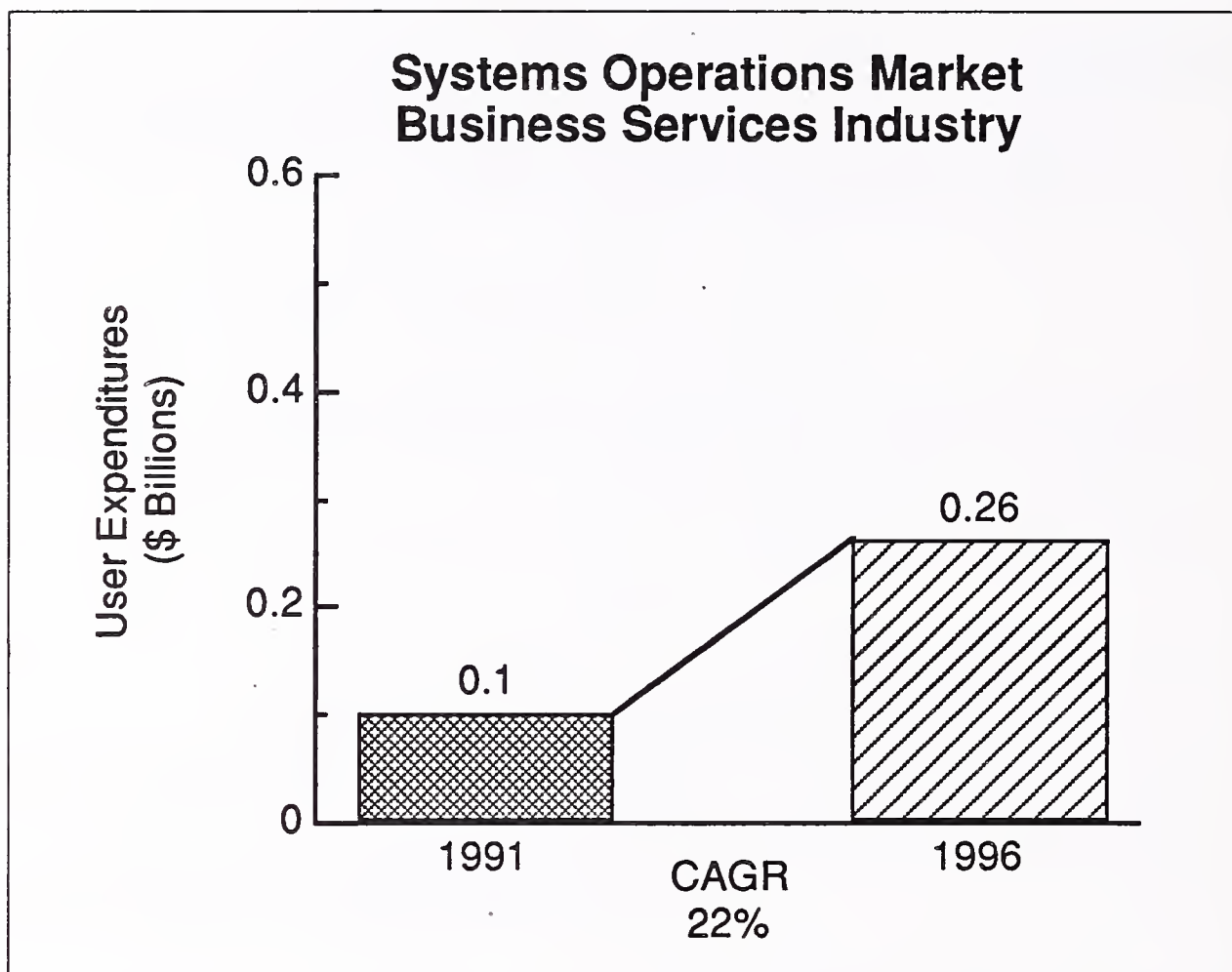
Key Factors in Business Services Industry

- Positive
 - Strong customer service orientation (airlines and hotels)
 - Need for cash in certain market subsegments
 - Need for network capabilities
- Negative
 - Segmented marketplace
 - Very diverse expertise required to service market

4. Systems Operations Forecast

The growth for this new sector is projected at 22% for the period 1991 to 1996, as seen in Exhibit IV-41. Continued activity in the hospitality segment of the market will probably lead to growth in systems operations in that area. The numbers reported here reflect the combining of business and technical services, which were reported separately last year.

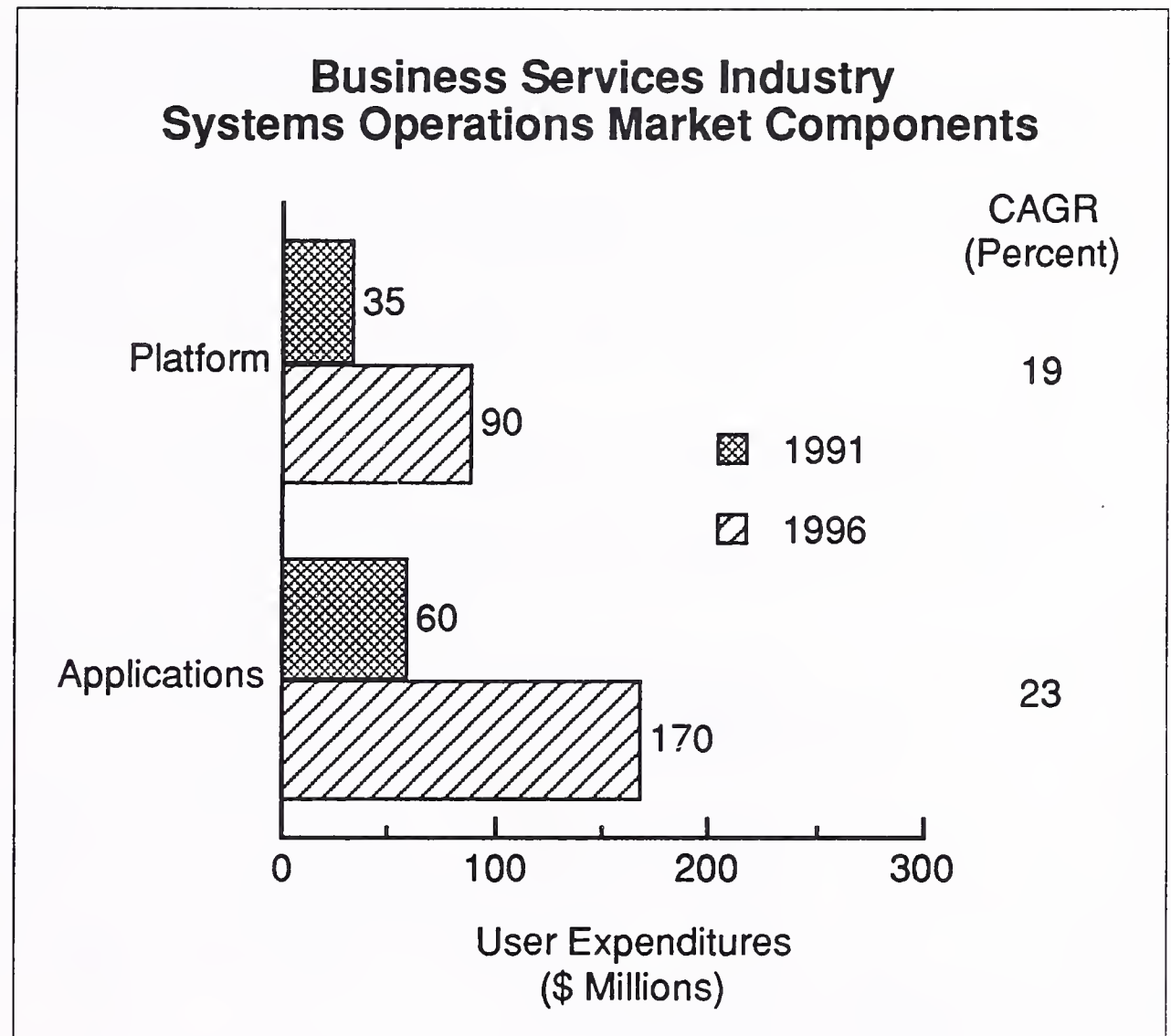
EXHIBIT IV-41



As demonstrated in Exhibit IV-42, there will be unbalanced growth in this vertical market between platform and applications processing expenditures. This change will accelerate if there is a major change in the relationships between vendors and clients in the airline reservation segment or in the hospitality sector.

EDS is the dominant vendor in this segment of the marketplace by virtue of its contacts with Continental Airlines, National Car Rental and Hospitality Franchise System. IBM is active in the hotel industry and may be expected to increase its market share.

EXHIBIT IV-42



O

Miscellaneous Industries

This sector includes companies engaged in the agricultural production and construction industries only. This category is the former "other" category without the entertainment and hospitality industries, membership organizations, museums and auto repairs. They have been reassigned to the business services sector.

1. Industry Forces

In the agriculture sector there are a few large, dominant firms that have large IS budgets. The difficulty is finding opportunities among the multitude of establishments included in this category. In the construction sector, there is more opportunity for information systems applications. However, the cyclical nature of this sector causes profitability and cash flow problems for construction companies and their information services vendors.

Crop price levels improved in 1990, due to a decrease in farm surplus stockpiles and an increase in international demand for meat products and feed grain. International standards of living are on the rise, which is driving up the demand for corn and soybean meal for livestock feed.

Recent developments in agricultural information applications include educational services, computer customer support, and on-line network services that carry information such as commodity and livestock future prices, weather information, and university agriculture classes.

The forces that affect the construction industry depend heavily on the size of the business and whether it has international business. Larger firms that compete in international markets follow different trends than firms solely in the U.S. construction market.

The U.S. Department of Commerce predicts strong recovery in construction activity, beginning in the mid-1990s. This prediction is based on its economic outlook for fairly stable interest rates, slow inflation, declining federal budget deficits and declining trade deficits. However, for the first five years of the 1990s, the Commerce Department is predicting that growth rates for new construction could be significantly lower than overall GNP growth rates during the same period. This prediction reflects an excess of office building construction, a near-term, high real-interest rate, and the current high level of the federal deficit which will limit spending for public works.

2. Information Systems and Services Environment

The medium-sized to large agribusinesses and cooperatives use centralized IS to provide the usual range of computer-based services. New requirements include expanding PC networks to connect to research institutions, county agencies, and distribution channels. Some are even extending their services to users in an outsourcing environment.

End-user participation is a critical issue for IS managers. Where users are not running systems, their assistance is necessary to develop requirements and application systems. Education, training, and support must be supplied to help users meet this challenge—from a very limited budget in most cases.

The impact of technology that can be used in the business or that can make information systems more useful and economic is an issue for IS managers, who must be prepared for changes in this volatile sector. New types of storage technology and more network capabilities can have a sizable impact on information systems use. They also create some SI opportunities for outsourcing vendors.

3. Systems Operations Potential

INPUT's user survey has not identified any significant interest in systems operations programs in agricultural companies or in construction companies. There is no identified major vendor activity in this sector at this time. INPUT will continue to monitor this sector for increased signs of activity.

4. Systems Operations Forecast

Exhibit IV-43 illustrates that this market segment will grow at a 15% CAGR for the period 1991-1996. This reflects some activity by large cooperatives such as Agway to provide services to smaller cooperatives, and some outsourcing of specific selected applications by the large engineering/construction firms.

EXHIBIT IV-43

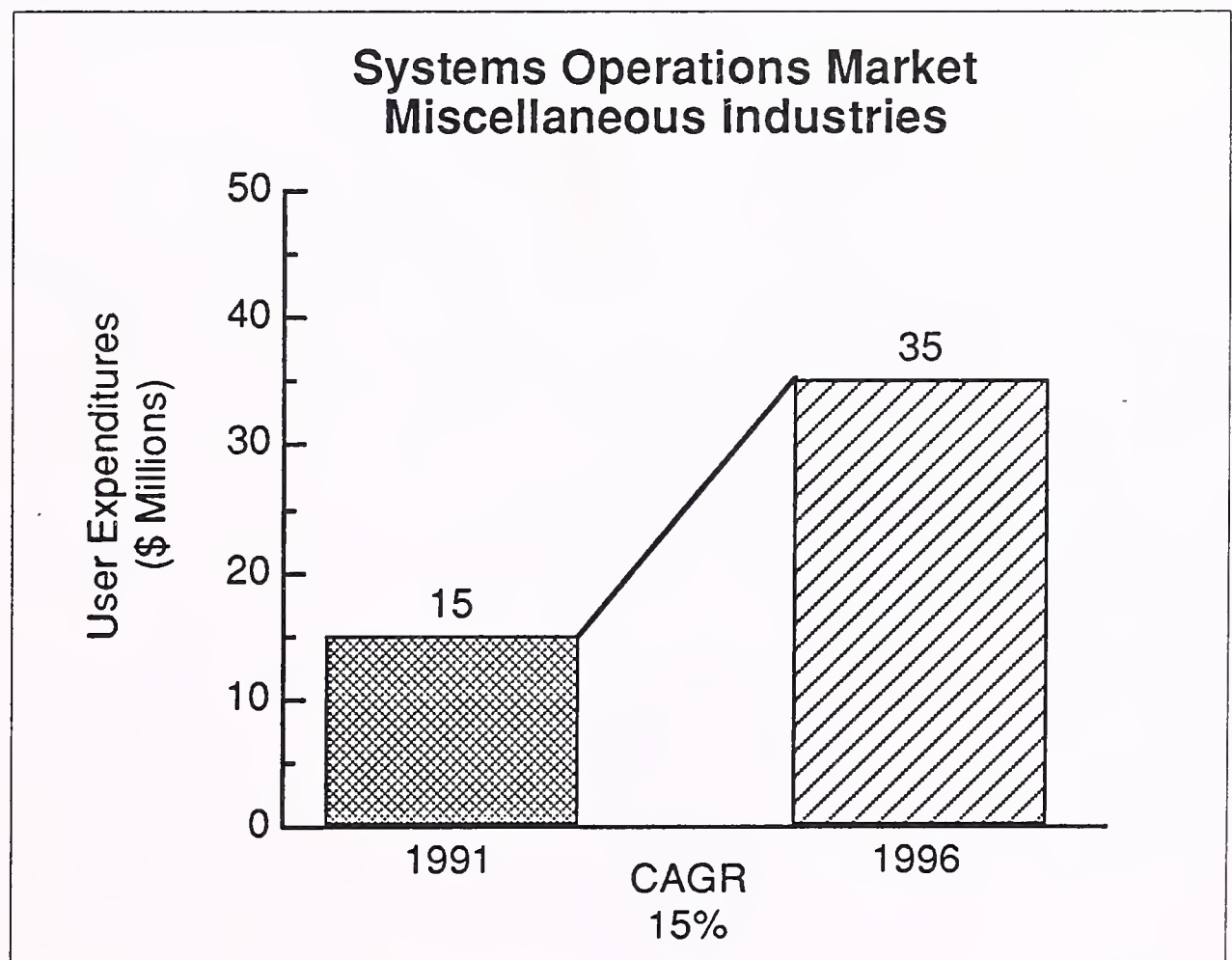
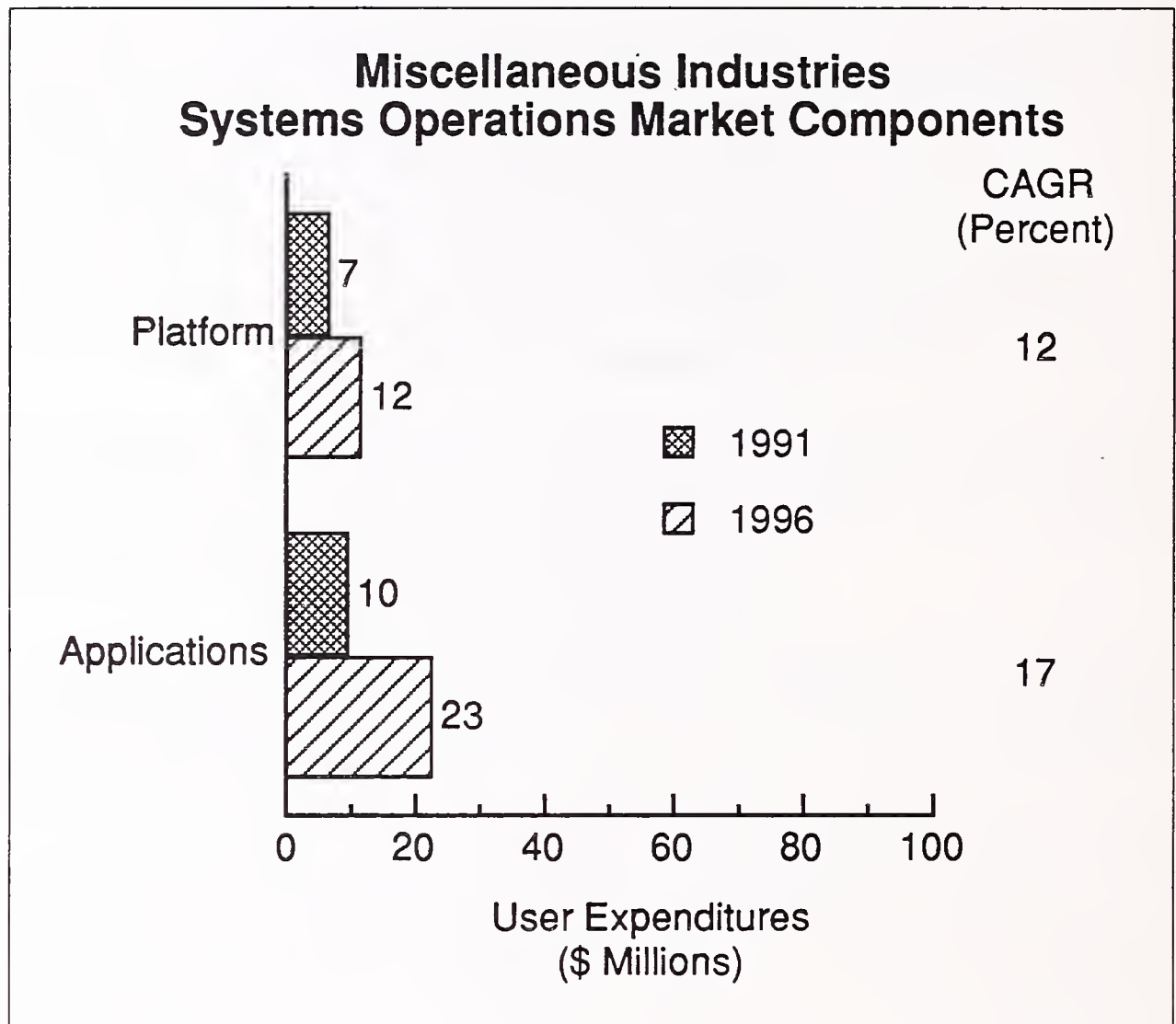


Exhibit IV-44 shows an accelerating rate in applications systems operations over the 1991 to 1996 period, as users become more willing to use applications that are proprietary to vendors.

EXHIBIT IV-44



P

Summary

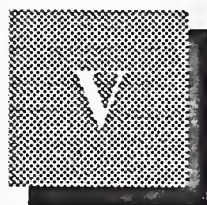
This analysis illustrates how varied the market conditions are within each vertical industry market. Thus, there is a growth rate of only 9% in one of the largest markets, the federal market, and rates above 20% in much smaller sectors such as retail distribution and business services. Some of this diversity reflects the difference in maturity of the various industry markets, but in the smaller markets, a significant win by a major vendor may change the complexion of that segment for several years.

Specialization continues to be effective where some specific industry knowledge is desired, but the “generalists”—usually large vendors—can counter with an established reputation and a large base of resources to apply creatively to prospects’ needs. There continues to be room for many types of vendors in this healthy market.



Market Strategies and Recommendations





Market Strategies and Recommendations

The systems operations market continues to be attractive for the outsourcing vendor. The long-term contracts stabilize revenue streams. The close relationship that evolves between the vendor and the client leads to better account control for the long term. Vendors can apply economies of scale, both to processing capacity and scarce technical resources, to leverage these across several clients.

Yet, the risks are significant. The vendor often makes a direct investment in the prospect's business by assuming responsibility for the operations staff and the processing equipment. The vendor's profits are closely tied to the fiscal health of the client; the vendor assumes business risks along with the client.

The marketing process must, therefore, be carefully orchestrated to ensure a high success ratio. Identification of real opportunities early in the cycle becomes critical to success. The techniques that best address the systems operations marketing environment need to be clearly defined. The new concept of vendor/client partnership that is developing needs to be explored in this context also. INPUT's market analysis leads to some recommendations on strategies to best succeed in this systems operations/outsourcing market.

A

Market and Opportunity Identification

There is no guide to successful sales in the systems operations marketplace. Yet, careful attention to trade literature, coupled with user and vendor interviews, can provide some useful insights into what has worked well in the past and what constitutes the characteristics of a successful deal.

There is a consistent set of characteristics that allows vendors to survey the prospect list and establish those with higher potential.

As was evident in Chapters III and IV, the vertical industry markets for systems operations vary greatly in their degree of penetration by systems operations vendors. Within those markets, a subset of the organizations most likely to benefit from systems operations outsourcing can be identified. Exhibit V-1 lists the types of companies that are likely to be good candidates for systems operations. These companies can be found in any industry.

Their receptivity to an outside vendor is generally closely related to their business situation. These trying economic times have created a wealth of situations in which firms will find outsourcing of systems operations an attractive alternative.

The prospect firm will be either in an industry that has shown good growth in systems operations or in which the vendor has some demonstrated experience. The prospect may be in an industry that has not yet shown good acceptance of systems operations outsourcing. The prospect is still viable since other characteristics are favorable. The company may be in transition. The company may need to make substantial changes in the way it is processing data. The company may be in financial trouble. In any case, the vendor must understand the company's business and must demonstrate that knowledge. The vendor that has had some prior business dealings with the firm has an advantage. If most of these qualifications are met, the sales cycle can continue.

When examining the marketplace for likely candidates, it is important not only to know the potential of that vertical industry, but also the vendor's previous relationship with the prospect. In a series of vendor interviews, INPUT determined that more than 70% of the respondents indicated their source of clients came from within their existing client base. In other words, they were most successful with prospects that already knew their company. Exhibit V-2 presents these findings. Note that in both the federal and the commercial marketplace, experience with the customer is an important success factor.

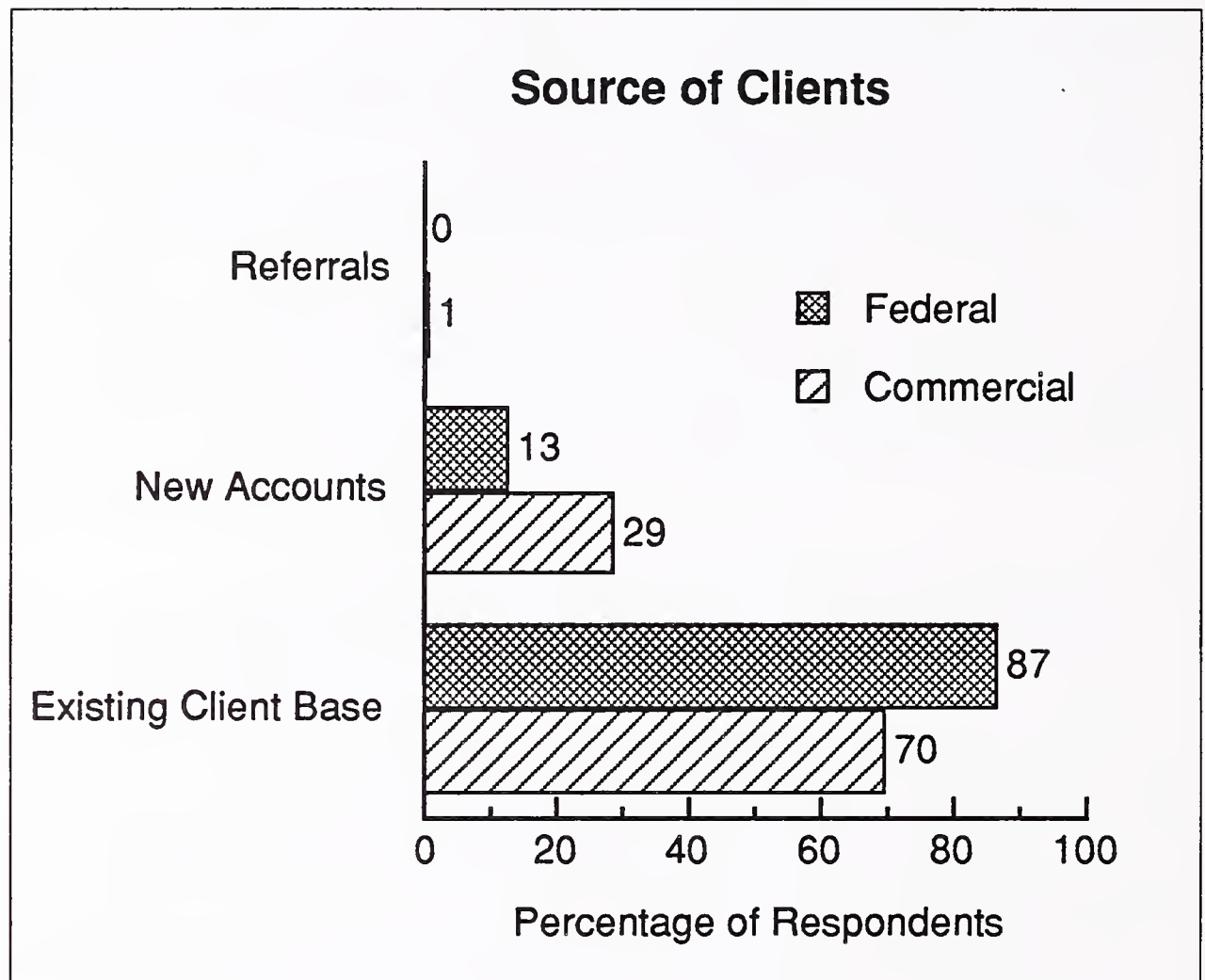
Prior experience can be in many areas: equipment sales, leveraging an earlier systems integration project, or a previous consulting engagement. The entry point is often a function of the type of vendor. Experience first opens the door, then becomes an important factor in the evaluation phase, particularly if all competitors are otherwise on equal footing. If the vendor has no experience with the client, then strong industry experience and references are essential.

EXHIBIT V-1

Good Systems Operations/Outsourcing Prospects

- Fast-growing organizations
 - Merging acquired data processing operations
 - Expanding geographic scope
- Organizations with major structural changes
 - Adjusting to divestitures
 - Reacting to a leveraged buyout
- Organizations in trouble
 - Recovering from bankruptcy
 - Operating under Chapter 11 protection
- Medium-sized organizations
 - Falling behind the technology curve
 - Having limited investment capital
- Organizations with disparate architectures
 - Wanting to change architecture
 - Having incompatible data centers
- Organizations refocusing on their core businesses
 - Concentrating on what they do well
 - Leveraging scarce resources

EXHIBIT V-2



In addition to industry knowledge and prior business relationships, there is a need to demonstrate the technical qualifications needed to do the entire job. Very few vendors have all the resources at hand to perform as the data processing arm of a firm in any industry they choose. The solution is to form alliances with other firms to round out capabilities that might be lacking. Exhibit V-3 tabulates a list of vendor capabilities and indicates in which areas interviewed vendors used alliances with third-party suppliers to obtain additional services.

In the operations, applications, and consulting areas, most firms have the capability in-house but still choose to go outside for particular expertise. In the less generic activities, even more vendors form alliances. Disaster recovery, equipment maintenance, and network communications are areas of systems operations that vendors often turn over to specialists, rather than establishing an in-house capability.

EXHIBIT V-3

Vendor Capabilities and Alliances

	Percent Having Internal Capability	Percent Using Alliances
Computer systems operations	100	40
Applications design/development	90	60
Business consulting	90	50
Applications maintenance	80	60
Packaged applications software	80	60
Disaster recovery service	60	80
Equipment maintenance	50	70
Network management	10	30

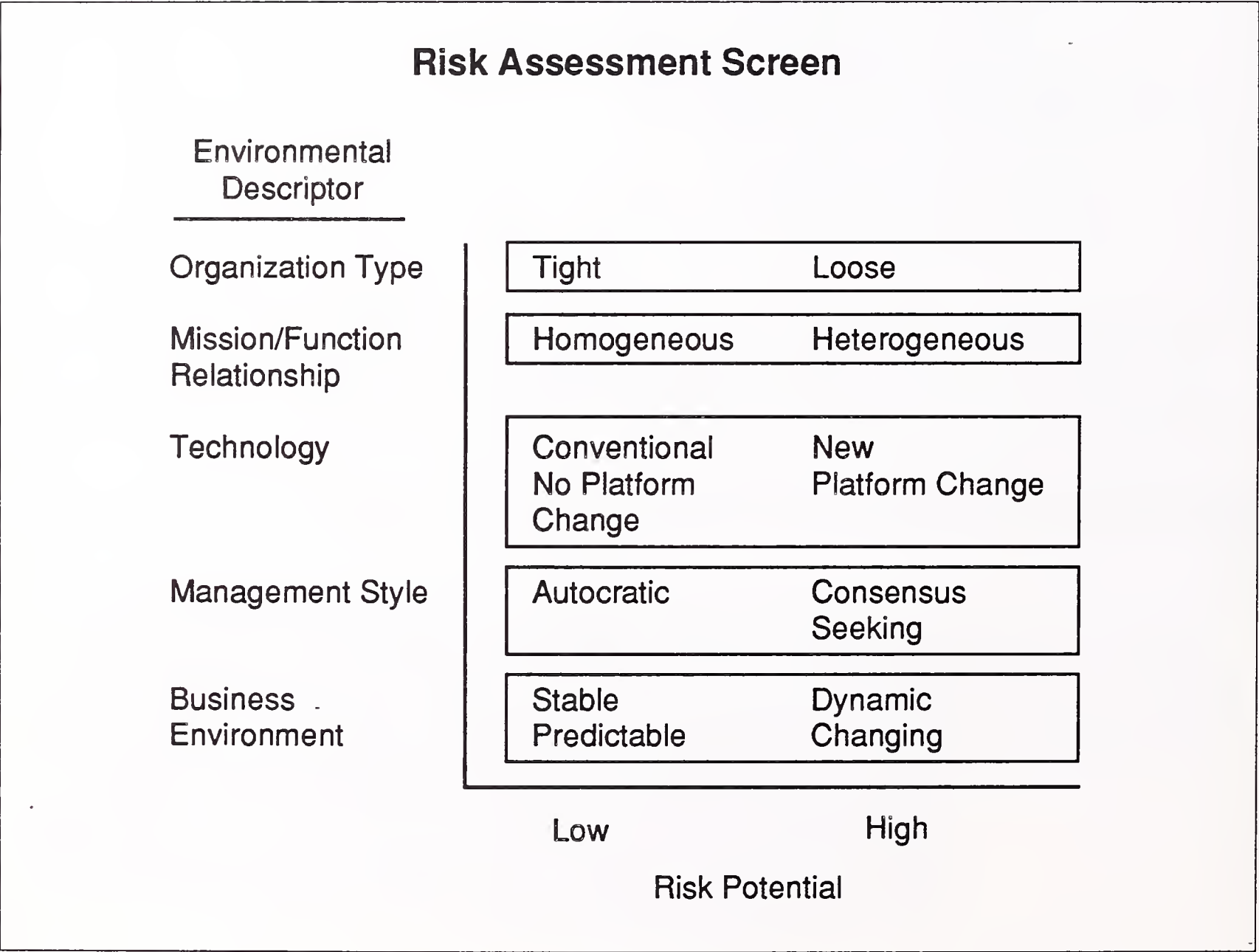
B**Risk Assessment**

A study entitled *Alternatives to Grand Design for Systems Modernization* was recently released by the General Services Administration (GSA). This report studies the risk factors inherent in major information technology projects undertaken by federal government agencies. GSA sought to identify what factors increase or reduce the risk of failure. A series of 29 case studies was conducted of both commercial and federal contracts to identify and better evaluate factors that contributed to success, failure, or long delays in project execution. They ranged from the massive FTS 2000 contract to provide telecommunications services to most federal agencies, to an automated service dispatching system for Otis Elevator.

There are lessons to be learned for commercial outsourcing vendors from this report. A risk assessment screen can be developed to look more closely at any prospect and identify how risky it would be to take over an organization’s operations. The assessment screen is not intended to discourage the pursuit of legitimate opportunities. Instead, it refines the selection process. In this way, vendors will have full knowledge of the risks prior to entering into an agreement with their clients.

A series of environmental factors can be identified and a risk potential spectrum postulated to describe the range of possibilities for each. Exhibit V-4 illustrates what a typical risk assessment screen would look like. It should be tailored to every prospective outsourcing opportunity, but the general case illustrated here is useful as a discipline.

EXHIBIT V-4



In this hypothetical scenario, five different environmental descriptors were evaluated to determine the amount of risk inherent in entering into a systems operations agreement with the prospect.

First, the vendor needs to understand the organization type clearly. Is it a tightly structured organization with clear lines of responsibility between management levels? Is the management structure much more open-ended? Obviously, it will be easier to get the initial decision in the tightly structured organization, and it will also be easier to deal with day-to-day operating problems in an organization where lines of authority are clearly delineated. Therefore, if the prospect has a tight organization, the risk potential is low.

How does the mission of the organization relate to the functions to be outsourced? In other words, when the core business of the prospect organization has a high information content, such as the insurance business or the reservation business, the risk is lower, since senior management is more likely to understand the outsourcing vendor's proposals. In an engineering company, information processing operations are often ancillary to the main business. This results in higher risk because information systems processes are less developed and more difficult to take over smoothly. This same mission/function relationship has the opposite impact on the probability of sales success. When the organization's mission and its processing function are very different, it is much easier to outsource that processing function.

The technology factor is obvious but must be considered in every case. Sometimes both parties (vendor and client) are comfortable with a processing environment that has been operating successfully for some time. Then, assuming responsibility for the entire operation involves very little risk. When new technology is to be introduced or the applications are to be moved to a new platform, the probability of problems is much higher.

The management style of the organization is often an important factor. An autocratic environment, one in which decisions emanate from one source, is easier to operate in than one in which consensus must be arrived at after much discussion. The ability to make quick decisions often avoids problems in the making and lowers the risk profile substantially.

We would all prefer to operate in a stable, predictable business environment, but that is not likely to be the case under current economic conditions. At least the business environment should be recognized as a factor that introduces another element of risk to the agreement between outsourcing vendors and their clients.

C

Bid/Proposal Preparation

A recurring theme in the vendor interviews conducted by INPUT was that the vendor and the client must develop a clear understanding of each other's capabilities and commitments before a real systems operations contract can be entered into. This will result in a long sales cycle. It will be a grueling task for both the vendor's marketing force and the prospect's evaluators. Obviously, both sides will want to maximize benefits.

Many commercial firms prepare a formal solicitation document for vendors, but others simply gather material that describes their current operating environment, combine that with their expectations and ask vendors to respond.

In INPUT's sampling of users, 50% of the prospects prepared a formal solicitation document. The prospect's purpose is to provide the vendors with a common set of data upon which to base their proposals. This makes it easier to compare the vendor responses during the evaluation phase. Respondents to INPUT's survey indicated that the preparation of the actual document took from two weeks to two months to prepare. The preparation was always the responsibility of the Chief Information Officer in the organization. This person usually was assisted by a staff analyst or, in some cases, by an outside management consultant.

Exhibit V-5 presents the types of information that are always provided to vendors, whether or not a formal solicitation documentation is prepared. There are no surprises here. No vendor can prepare a valid proposal without at least this basic data. The fact that the list is not longer is a bit surprising, though. It is also revealing that the buyer's transition plan expectations are generally not included in the solicitation documentation, for example.

EXHIBIT V-5

Elements Common to All Solicitations

- Current processing equipment
- Current systems software
- Current applications software

In addition to the basic data identified in Exhibit V-5, other information is usually provided to prospective vendors to allow them to better tailor their responses to the specific needs of the company. This information varies by buyer but generally includes the items shown in Exhibit V-6.

EXHIBIT V-6

Contents of Solicitation Document

Item	Number of Responses
SMF Data	9
Communications Requirements	8
Processing Volumes	7
Current Staffing	6
Transition Plans	4
Data Storage Requirements	4

By providing resource accounting data such as SMF (Systems Management Facilities) data, and other operating parameters such as data storage requirements, the buyer is giving the vendor still more information with which to sharpen the proposal.

Network communications requirements are only provided if the vendor is being asked to provide that part of the service. In some of the cases reviewed, the buyer was either retaining management of that component or outsourcing that service under a separate contract. Most recent outsourcing agreements are including communications in the agreement and vendors are prepared to provide this service in most instances.

Whenever the user is considering being shifted to a shared environment at the vendor's site, processing volume needs to be provided. When the buyer is seeking a proposal in which the vendor simply takes over the entire existing operation, this data is less important. Even then it is advisable to provide it, since it gives the more aggressive vendor additional data on which to do an economic analysis and prepare a more cost-effective solution. In tight competition, the vendor that uses this data to propose a downsized processing environment at substantial savings to the user has a significant advantage.

Staff deployment data, including current headcount and skills inventories, is essential if the proposal is to include transfer of the operating staff from the user to the vendor. More and more systems operations outsourcing agreements include such arrangements.

Some buyers carefully outline their transition expectations of prospective vendors. This may be dictated by a corporate divestiture schedule or by some other external factor. A surprising number of respondents indicated that they did not provide such data, however, as they feel that vendors are often more experienced and capable of establishing the transition schedule than their own staffs.

Most respondents indicated that they did not provide cost information to prospective vendors. Those that did felt the openness and understanding of each other's business made it easier to reach a better working relationship in the final agreement. In cases where the data was provided, the comment was made that it was the most difficult to compile and to provide in a meaningful form for the vendors.

Once the data describing the current environment is assembled and the organization's requirements are clearly stated, bids can be solicited from SO vendors. Unlike the federal government market environment, requests for proposals are not advertised for the vendor community at large to review. Companies send out bid requests only to those companies they feel can respond positively. It is the vendor's responsibility to make its presence known in the user community.

As mentioned above, 50% of the respondents issued formal requests for bids. The other firms simply assembled their requirement data and notified known vendors or current suppliers that they were looking for an external systems operations management arrangement.

The challenge to the vendor's marketing staff is to know when an SO solicitation is being prepared by a potential client. The commercial market certainly favors any vendor that has an ongoing relationship with a company. Vendors with strong reputations and a proven track record in a given industry market will probably also get invitations to bid.

D

Client Selection Criteria

The selection process is essentially a screening process. The first set of responding vendors is narrowed down to a smaller, more viable short list through a preliminary evaluation. This usually involves a comparison of some common criteria. The short list of vendors is then reviewed more thoroughly and discussions are typically begun with several vendors. At this point, more data is generally exchanged between the buyer and the vendors; further refinements of the requirements are made, and visits to client sites are scheduled.

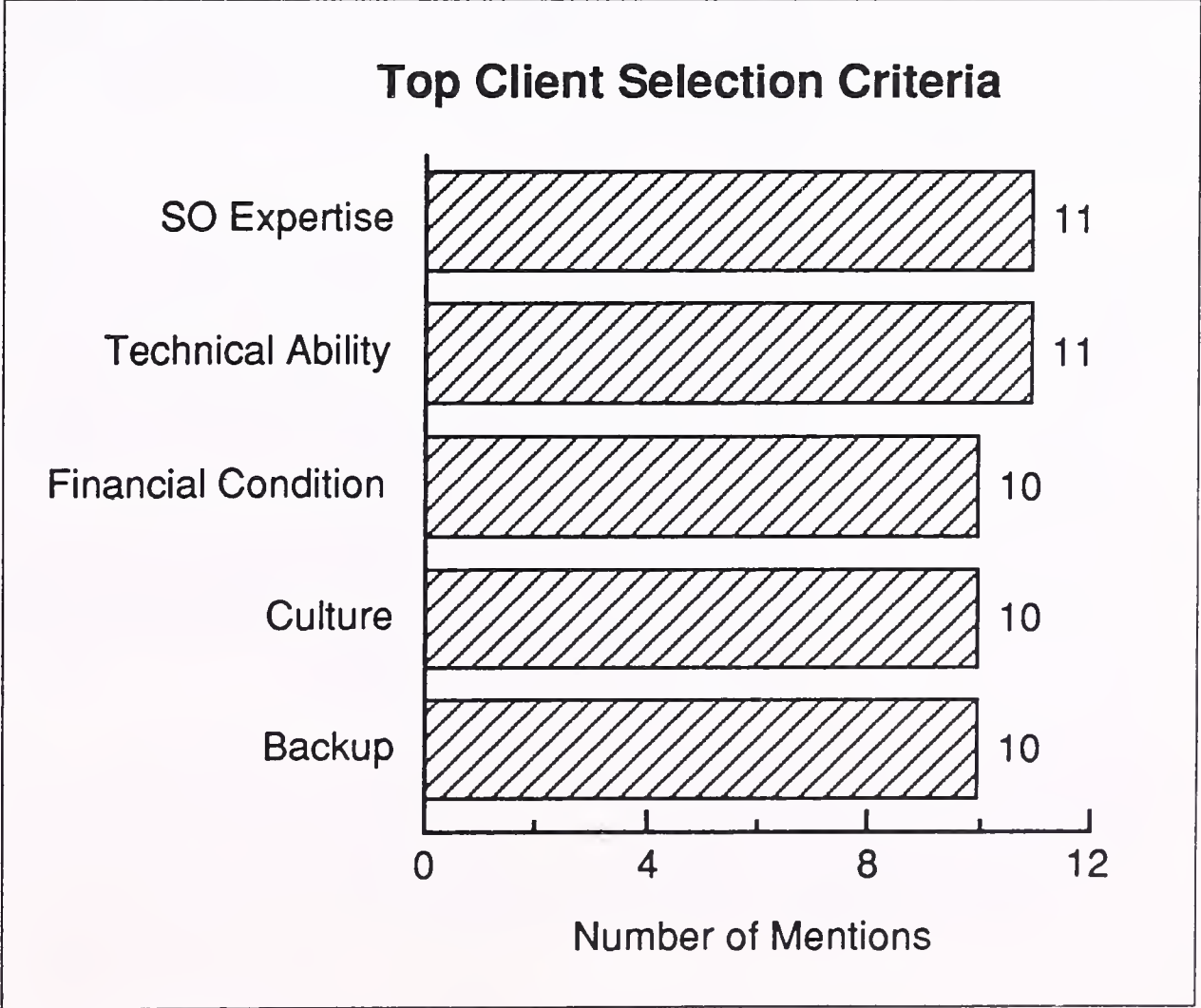
Unlike the process of “sealed bids” so common in the public sector, there is much discussion at the second stage between buyers and vendors with regard to services provided and the price for these services. The systems operations vendor trying to move from the federal marketplace into the commercial market should be aware of this and be prepared to interact with the prospect during the selection phase.

The evaluation and selection process generally takes from 3 weeks to 6 months, with the majority taking at least three months. The evaluation team, usually made up of the same people who prepared the solicitation document, prepares a recommendation for an executive board. The recommendation of the evaluation team is generally accepted without extensive discussion by the board. This process is more formal in the financial community than in the manufacturing sector.

The real discriminators between vendors are not generally of a specific technical nature. How the vendor proposes to assist in the relocation of staff or how the user interface will be handled is often more important in the evaluation than the price per transaction or the transition plan submitted by the vendor.

Certain vendor capabilities repeatedly appeared in selection criteria. Exhibit V-7 presents the data on the number of times the major evaluation criteria were mentioned by the respondents to an earlier INPUT study.

EXHIBIT V-7



The most frequently mentioned items were the related criteria, SO experience and technical ability. Note that experience was defined as prior systems operations experience. Buyers wanted to entrust their data processing centers to experienced hands, not to new players in the game. They were much less concerned whether the vendor had any experience in the buyer's own industry. The comment was often made that they, the buyers, had enough knowledge of their own industry and did not need to rely on the vendor. They reinforced this statement by indicating that they evaluated the general technical abilities of the vendor rather than industry knowledge. The respondents in the banking industry were an exception to that rule. They preferred that the selected vendor know a lot about the banking industry.

The next most frequently mentioned item was the financial stability of the prospective vendor. Buyers are looking for some assurance that the selected vendors can do the job. They also want to be sure that, if they turn over their processing to a third party, that firm will be a viable provider for the long term. For that reason they heavily weigh the financial condition of the vendor as an important characteristic.

The issue of culture needs further explanation. Respondents said there had to be a similarity of culture between their organization and the vendor's. This usually meant that the vendor had to be perceived as having the same concern for quality and/or service as the buyer, or the same conservative attitude toward technology changes and investment in new equipment. This is a reasonable requirement, since the buyer's staff will have to be working very closely with the vendor's staff to achieve common objectives.

Backup and disaster recovery provisions are important to all buyers. Only in cases where the buyer provided backup through a third party was disaster recovery not included in the list of evaluation criteria. It did not seem to be necessary that vendors provide the disaster backup themselves, but they had to make it available at least through a third party. In fact, since backup should be provided from an alternate site, it may be perceived as an advantage if a third party provides it.

Several other selection criteria were less frequently mentioned by respondents to INPUT's user survey. A more thorough discussion of these less important items can be found in INPUT's report, *Systems Operations—Buyers Issues and Alternatives*.

E

Client and Vendor Management Strategies

It is obviously a massive sales and marketing task to identify the most likely prospect for a systems operations project, line up the proper alliances to round out the vendors' technical capabilities, and conduct the negotiations that lead to a successful sale. Yet, in some ways, the job for the systems operations vendor is just beginning. The relationship of the systems operations vendor to the client is much more closely meshed than in most other IS marketing situations. Discussions with users and vendors have pointed out that a new type of relationship is being forged. The term *partnership* has been used by vendors and users to identify the relationship that must exist if a systems operations agreement is to be successful. This relationship begins the day the contract is signed and continues throughout the life of the contract, which is typically five to ten years.

The client usually agrees to be completely dependent on a vendor for all its data processing operations. The vendor generally invests in the client's firm by assuming financial responsibility for computer hardware, facilities, and staff. The relationship has to go beyond a simple contractual arrangement in this case. Vendors and users are increasingly aware of the need for a managed partnership.

The tools that make this type of partnership work are not clearly defined in management textbooks or in business school lectures. Some might be identified by a close scrutiny of case studies, however. INPUT talked to both vendors and users and has identified a set of factors that can make a systems operations partnership successful. Exhibit V-8 summarizes these factors.

Open communication is essential. Not only must the vendor be taking the pulse of the user on a daily basis, but senior management of both companies must be in constant communication to assure a smooth start to the project and responsive operations during the whole life of the contract. There is no better way to nurture the relationship than to have vendor personnel intimately involved in the planning and strategy development for the client firm. That implies that the vendor will also be privy to much proprietary information. This is necessary if the vendor, in turn, is to apply the systems resources to the best competitive advantage of the client.

Many respondents cited that the working arrangements must evolve away from the legal terms of the formal contract toward a true working partnership. Both parties are motivated to take risks and assume responsibilities that are mutually beneficial. These are impressive sounding words, yet many of respondents are convinced that this is the only way these contracts will work.

EXHIBIT V-8

**Tools for Management of the
Systems Operations Partnership**

- Open communication
 - Daily, at user level
 - Frequent visits at senior management levels
- Strategic planning
 - Vendor must be part of process
 - User must share key information with vendor
- More than a contract
 - Sharing of risks over time
 - Verbal agreements supplement contract
 - Need for mutual trust

F**Recommendations**

The marketing strategies exhibited by the major vendors, the selection practices of the user community, and the management strategies in place after the contract is negotiated have now been reviewed. All of this discussion leads naturally to a set of recommendations for vendors to help them assess both prospect potential and successful implementation of systems operations opportunities. These are summarized in Exhibit V-9.

EXHIBIT V-9

Recommendations

- Pre-Sales
 - Select high-probability prospects
 - Establish strong alliances
 - Assume risk carefully
- Post-Sales
 - Communicate constantly
 - Develop partnership relationship
 - Participate in client strategy development

The key recommendations for the pre-sales cycle are:

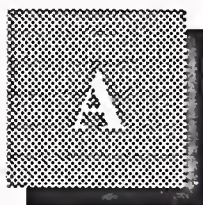
- Select prospects carefully to capitalize on existing knowledge in the target industry.
- Enhance credibility by demonstrating prior success, either with that prospect or within the prospect's industry.
- Capitalize on long-term pre-existing relationships with the prospect, who feels that such a relationship is indeed the best choice.
- Establish strong alliances with partners that can both supplement industry expertise and provide additional cost-effective resources.
- Understand that the vendor will need to assume some financial risk, usually involving a capital investment or assumption of some of the client's assets.
- Develop contractual terms that protect against undue risk for both parties.

The key factors of the post-sale period need to be considered from the onset of the sales cycle also. They are:

- Communicate within the client's organization with both the user and senior management, on a daily basis if necessary.
- Vendor personnel need to become part of the client's organization, providing a service level even better than that provided by the internal staff.
- The formal contract will need to be supplemented by both parties' agreeing that the good of the partnership will often require actions not specifically written in the contract.
- The vendor and client must have joint strategy sessions at which important issues can be discussed and key information shared.

Vendors that successfully master the development of partnerships will be the major systems operations/outsourcing vendors that benefit most from this expanding market segment.

Appendixes

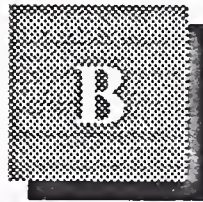


Appendix: Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarry non-metallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries

Industry Sector	SIC Code	Description
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)
Utilities	49xx	Electric, gas and sanitary services
Telecommunications	48xx	Communications
Retail Distribution	52xx	Building materials
	53xx	General merchandise stores
	54xx	Food stores
	55xx	Automotive dealers, gas stations
	56xx	Apparel and accessory stores
	57xx	Home furniture, furnishings and accessory stores
	58xx	Eating and drinking places
	59xx	Miscellaneous retail
Wholesale Distribution	50xx	Wholesale trade - durable goods
	51xx	Wholesale trade - nondurable goods
Banking and finance	60xx	Depository institutions
	61xx	Nondepository institutions
	62xx	Security and commodity brokers, dealers, exchanges and services
	67xx	Holding and other investment offices
Insurance	63xx	Insurance carriers
	64xx	Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services

Industry Sector	SIC Code	Description
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Governments	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - live-stock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors



Appendix: Forecast Data Base

EXHIBIT B-1

**Platform Systems Operations
User Expenditure by Industry Sector, 1990-1996
(\$ Millions)**

Industry Sector	1990 (\$)	Growth 90-91 (%)	1991 (\$)	1992 (\$)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	CAGR 91-96 (%)
Discrete Manufacturing	227	18	268	321	373	425	476	533	15
Process Manufacturing	176	18	208	249	289	330	369	413	15
Transportation	91	19	108	132	164	193	224	260	19
Utilities	17	14	19	22	25	28	30	34	12
Telecommunications	26	15	30	34	39	45	50	57	14
Wholesale Distribution	40	19	48	57	66	77	88	99	16
Retail Distribution	82	20	98	122	149	183	216	253	21
Banking/Finance	640	13	723	832	940	1,043	1,158	1,285	12
Insurance	359	16	416	479	551	611	666	726	12
Health Services	405	15	466	536	611	690	766	850	13
Business Services	31	20	37	45	54	65	77	89	19
Federal Government	607	9	662	721	786	857	934	1,018	9
State/Local Government	353	13	399	471	546	617	685	760	14
Education	54	13	61	70	78	87	97	108	12
Miscellaneous	6	15	7	8	9	10	11	12	12
Total	3,114	14	3,550	4,099	4,680	5,261	5,847	6,497	13

EXHIBIT B-2

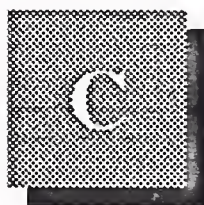
Applications Systems Operations
User Expenditure by Industry Sector, 1990-1996
(\$ Millions)

Industry Sector	1990 (\$)	Growth 90-91 (%)	1991 (\$)	1992 (\$)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	CAGR 91-96 (%)
Discrete Manufacturing	259	18	306	367	455	564	699	867	23
Process Manufacturing	219	18	258	310	385	477	591	733	23
Transportation	33	22	40	49	62	76	94	117	24
Utilities	8	14	9	10	13	15	17	21	18
Telecommunications	38	15	44	50	63	81	97	118	22
Wholesale Distribution	26	19	31	37	45	54	66	82	21
Retail Distribution	68	24	84	105	136	177	230	299	29
Banking/Finance	1,121	18	1,323	1,587	1,921	2,324	2,812	3,374	21
Insurance	419	16	486	559	676	805	966	1,159	19
Health Services	348	15	400	488	601	739	916	1,136	23
Business Services	49	23	60	74	90	112	139	172	23
Federal Government	939	9	1,024	1,116	1,216	1,325	1,445	1,575	9
State/Local Government	568	15	653	771	925	1,110	1,332	1,598	20
Education	19	15	22	25	29	33	39	47	17
Miscellaneous	9	15	10	12	14	16	19	23	17
Total	4,123	15	4,750	5,560	6,631	7,908	9,462	11,321	19

EXHIBIT B-3

Systems Operations User Expenditure
Forecast Total, 1990-1996
(\$ Millions)

Industry Sector	1990 (\$)	Growth 90-91 (%)	1991 (\$)	1992 (\$)	1993 (\$)	1994 (\$)	1995 (\$)	1996 (\$)	CAGR 91-96 (%)
Discrete Manufacturing	486	18	574	688	828	989	1,175	1,400	20
Process Manufacturing	395	18	466	559	674	807	960	1,146	0
Transportation	124	20	148	181	226	269	318	377	20
Utilities	25	14	28	32	38	43	47	55	17
Telecommunications	64	15	74	84	102	126	147	175	19
Wholesale Distribution	66	19	79	94	111	131	154	181	18
Retail Distribution	150	22	182	227	285	360	446	552	25
Banking/Finance	1,761	16	2,046	2,419	2,861	3,367	3,970	4,659	18
Insurance	778	16	902	1,038	1,227	1,416	1,632	1,885	16
Health Services	753	15	866	1,024	1,212	1,429	1,682	1,986	18
Business Services	80	22	97	119	144	177	216	261	22
Federal Government	1,546	9	1,686	1,837	2,002	2,182	2,379	2,593	9
State/Local Government	921	14	1,052	1,242	1,471	1,727	2,017	2,358	18
Education	73	14	83	95	107	120	136	155	13
Miscellaneous	15	15	17	20	23	26	30	35	15
Total	7,237	15	8,300	9,659	11,311	13,169	15,309	17,818	17



Appendix: Data Base Reconciliation by Industry Sector

EXHIBIT C-1

**Data Base Reconciliation by Industry Sector
(\$ Millions)**

Delivery Mode	1990 Market				1995 Market				90-95 CAGR per data 90 rpt (%)	90-95 CAGR per data 91 rpt (%)
	1990 Report (Fcst) (\$)	1991 Report (Actual) (\$)	Variance from 1990 Report		1990 Report (Fcst) (\$)	1991 Report (Fcst) (\$)	Variance from 1990 Report			
			(\$)	(%)			(\$)	(%)		
Discrete Manufacturing	482	486	+4	+1	1,330	1,175	-155	-12	22	20
Process Manufacturing	521	395	-126	-24	1,113	960	-153	-14	16	20
Transportation	51	124	+73	+143	106	318	+212	+200	16	20
Utilities	45	25	-20	-44	90	47	-43	-47	15	14
Telecommunications	65	64	-1	0	134	147	+13	+11	16	19
Wholesale Distribution	92	66	-26	-28	216	154	-62	-29	19	18
Retail Distribution	76	150	+74	+97	222	446	+224	+100	24	25
Banking/Finance	1,931	1,761	-170	-9	4,057	3,970	-87	-2	16	18
Insurance	801	778	-23	-3	1,301	1,632	+331	+25	10	16
Health Services	833	753	-80	-10	1,825	1,682	-143	-8	17	18
Business Services	42	80	+38	+90	108	216	+108	+100	18	22
Federal Government	1,271	1,546	+275	+22	2,090	2,379	+289	+14	10	9
State/Local Government	956	921	-35	-4	2,495	2,017	-478	-19	21	18
Education	94	73	-21	-22	165	136	-29	-17	14	13
Miscellaneous	0	15	+15	N/A	0	30	+30	N/A	N/A	15
Total	7,260	7,237	-23	-.3	15,252	15,309	+57	+.3	16	17

